

REPORT OF THE JOINT EXPERT PANEL

September 2018

The Joint Expert Panel on the Universities
Superannuation Scheme commissioned
by the University and College Union
and Universities UK.

CONTENTS

1. CHAIR'S INTRODUCTION.....	4
2. EXECUTIVE SUMMARY.....	6
3. THE JEP'S WORK PROGRAMME AND EVIDENCE BASE.....	13
4. DEFINING THE ISSUES	17
5. ABOUT USS	23
6. JEP ASSESSMENT OF THE DRAFT 2017 USS VALUATION	24
7. VALUATION PROCESS AND GOVERNANCE.....	42
8. CONCLUDING THE 2017 VALUATION	51
9. LOOKING AHEAD	65
ANNEXES.....	66
GLOSSARY OF TERMS.....	67
ANNEX 1: JEP MEMBERSHIP	70
ANNEX 2: JEP TERMS OF REFERENCE.....	72
ANNEX 3: ACAS AGREEMENT 23 MARCH 2018	75
TECHNICAL ANNEXES.....	77
ANNEX 4: ABOUT USS	78
ANNEX 5: SPECIMEN SLIDES FROM THE EY PARTHENON REVIEW OF THE HIGHER EDUCATION SECTOR	88
ANNEX 6: SPECIMEN SLIDES FROM THE PwC COVENANCE ASSESSMENT OF USS.....	92
ANNEX 7: GROWTH OF USS RELATIVE TO THE HIGHER EDUCATION SECTOR	94
ANNEX 8: ADD ₁₃ CONTRACTION OF HIGHER EDUCATION SECTOR BY 20%, EFFECT ON CONTRIBUTION REQUIREMENTS	96
ANNEX 9: ADD ₃₆ VALUATION EXPERIENCE.....	97
ANNEX 10: AON ADVICE TO THE JEP	104
ANNEX 11: FIRST ACTUARIAL ADVICE TO THE JEP	109

Figure 1: List of abbreviations	3
Figure 2: Evidence used	14
Figure 3: JEP work programme	16
Figure 4: JEP Terms of Reference – in scope and out of scope (Phase 1)	18
Figure 5: A high level, simplified schematic describing Test 1	26
Figure 6: Panel summary of USS consultation proposals (% of salary per annum)	39
Figure 7: Summary of the Panel’s views on the 2017 draft valuation	40
Figure 8: Areas for possible adjustment to the 2017 valuation	53
Figure 9: Range of potential reliance that may be provided by employers in the 2017 valuation	55
Figure 10: Potential impact of adjustments on member and employer contributions (no employer match for DC)	61
Figure 11: Potential impact of adjustments on deficit and future service contributions (no employer match for DC)	63
Figure 12: USS benefit structure	79
Figure 13: History of USS benefit structure and contribution changes	80
Figure 14: Employer contribution breakdown (percentage of payroll)	81
Figure 15: Membership by category 2014-2018	81
Figure 16: Scheme membership (proportion of total membership) by category 2014, 2017 and 2018	82
Figure 17: Deficit share by sector	83
Figure 18: Size of the Scheme relative to the sector in real terms	84
Figure 19: USS Retirement Income Builder - asset allocation (%) as at 31 March 2018	86
Figure 20: USS governance structure	87

Figure 1: List of abbreviations

ACAS	Advisory, Conciliation and Arbitration Service
CPI	Consumer Price Index
DC	Defined Contribution
DB	Defined Benefit
DRCs	Deficit Recovery Contributions
FBB	Fundamental Building Blocks
FSCs	Future Service Contributions
HE	Higher Education
HEI	Higher Education Institution
JEP	Joint Expert Panel (also the Panel)
JNC	Joint Negotiating Committee
RPI	Retail Price Index
ToR	Terms of Reference
TPs	Technical Provisions
TPR	The Pensions Regulator
UCU	University and College Union
USS	Universities Superannuation Scheme
UUK	Universities UK

A full glossary of terms is available in the Annex to this report

1. CHAIR'S INTRODUCTION

On behalf of the Joint Expert Panel (JEP), I am pleased to present the Panel's first report. The conclusions and recommendations are the unanimous views of the Panel.

This report focuses on the first phase of the Panel's work, as set out in our Terms of Reference (ToR), namely to review the basis for the USS Scheme 2017 valuation assumptions and associated tests.

Since starting work in May, the Panel has worked at pace to understand the Scheme, the Trustee's¹ valuation methodology and assumptions and to undertake its own analysis. In doing so we have taken evidence from a range of parties directly involved with the valuation as well as Scheme members and sponsoring employers. We are grateful to all those who took the time to provide evidence to the Panel.

USS is one of the largest, most sophisticated and complex pension schemes in the UK with a number of unique features, including its approach to the valuation. It is clear that the Scheme is highly valued by its members and sponsoring employers. In our deliberations and in reaching our conclusions, we have carefully balanced the value placed by members on their Scheme and the need to provide sustainability and affordability for all involved.

The mix of a highly valued Scheme, the need for affordability and sustainability and the Scheme's complexity places a responsibility on all its stakeholders to ensure that its arrangements are clearly understood. Only in this way can confidence be restored.

Our report makes a number of observations and recommendations about the 2017 valuation, methodology and assumptions as well as the process surrounding the valuation. We hope our observations, which should be taken as a whole, will prove constructive in considering how the 2017 valuation should be completed. But we hope that the principles underlying our conclusions will also inform the approaches of both major stakeholders to future valuations.

Our analysis has highlighted a number of issues arising out of the methodology and assumptions which we believe should be addressed. Furthermore, since the consultation on the 2017 valuation with employers², there have been a number of developments of

¹ Where we refer to the Trustee this should be taken to mean the USS Limited Trustee Company.

² 2017 Actuarial Valuation. A consultation with Universities UK on the proposed assumptions for the Scheme's technical provisions and Statement of Funding Principles. September 2017

relevance to the valuation assumptions. We have examined the impact of all these factors. On the basis of our analysis we have made a number of recommendations, the overall effect of which would be to reduce the valuation estimates of the future service cost and deficit to the point where the increase is small enough to allow the Joint Negotiating Committee (JNC) to be able to reach an agreement so that the issues currently facing the Scheme can be resolved, recognising that compromise may be needed on all sides.

In reaching our conclusions and recommendations the JEP has, of course, had the benefit of hindsight – a luxury not available to the Trustee as it worked to a tight timetable to complete the valuation. We recognise that the job of the USS Trustee is not a simple one. It has not been the approach of the Panel to be critical of any party that has been involved in the valuation. Our observations, conclusions and recommendations are intended to be constructive and should be read in that spirit.

We recommend that the JNC and the Trustee come together to work at speed to agree a process that will enable any changes resulting from our recommendations to be implemented early in 2019. It will, of course, be for UCU and UUK (through the JNC and their respective democratic structures) to determine the best way forward. Recognising that the Trustee has started consultation on the implementation of Scheme Rule 76.4-8 it will also be important that all parties work in a co-ordinated fashion. Over the shorter term this will help build stakeholder support and confidence. Over the longer term it will help ensure a more cohesive and robust approach to Scheme management.

This report is confined to the issues relating to the 2017 valuation, as defined in our ToR. However, it is clear from our assessment of the issues that further work is required. This should aim at delivering an approach to future valuations that is clear (and clearly understood by stakeholders) and which can deliver both a sustainable Scheme and a shared set of principles. This will be for Phase 2 of the JEP's activities. We have suggested some areas for further investigation in this report and a possible timescale for delivery of a second phase of work.

I would like to thank the members of the Panel for their contributions, commitment and, above all, expertise. Finally, thanks also goes to Alan Scobbie, Mary Lambe, Matt Waddup and Jackie Wells who have provided expert support and advice to both the Panel and me as Chair, and without whom it would not have been possible to operate and to produce this report within such a short timeframe.

Joanne Segars
Chair
Joint Expert Panel

2. EXECUTIVE SUMMARY

SCOPE OF THIS REPORT AND TERMS OF REFERENCE

- This report focuses on the first phase of the Joint Expert Panel's (JEP's) ToR, namely to review the basis for the Scheme's 2017 valuation, assumptions and associated tests. This has included:
 - a review of the 2017 valuation to date, including an assessment of the methodology, assumptions and process underpinning it; and
 - exploring the scope for possible revisions to the methodology and assumptions to allow the valuation to be completed without invoking cost-sharing through rule 76.4-8 of the Scheme Rules.
- In undertaking its work, the JEP has been asked to take into account:
 - the unique nature of the HE sector;
 - considerations of intergenerational fairness and equality;
 - the need to strike a fair balance between stability and risk; and
 - the current legal and regulatory framework.
- The JEP has not, in this phase of its work, considered valuations beyond the 2017 valuation. That would be the subject of a follow-up report. However, we have taken the opportunity in this report to suggest areas for future investigation and consideration.

JEP'S WORKING METHODS

- The JEP has held 11 day-long meetings between May and September 2018. The Panel has taken an evidence-based approach to developing its analysis of the Scheme and 2017 valuation. It has held 11 oral evidence sessions with a number of parties directly associated with the valuation – including the Trustee and its actuarial and covenant advisers – and has challenged those called to provide evidence. The Panel has also actively sought evidence from Scheme members and participating employers. Fifty-five submissions were received. These have all been reviewed and considered by the Panel.
- The JEP commissioned a joint report from UUK and UCU's actuarial advisers – AON and First Actuarial. This report was provided by the two firms working together using their intimate knowledge and understanding of the Scheme, but importantly without the input or involvement of UUK and UCU (i.e. it was produced independently for the Panel). In addition, new analysis was requested from the Trustee.

- Throughout the Panel's work, the Trustee and its Executive has engaged actively with the JEP and has provided the Panel with a considerable volume of information, much of which has not been in the public domain.

ABOUT USS

- USS is the UK's largest private occupational pension scheme by assets, with £63.6bn of assets under management as at 31 March 2018. The Scheme provides a mix of defined benefit (DB) and defined contribution (DC) benefits through a hybrid benefit structure introduced in 2016. Members accrue career average revalued earnings (CARE) defined benefits up to a 'salary threshold', which is currently £57,216.50 per annum. Above this threshold, members build up DC benefits with contributions based on their salary above the threshold. Approximately 80% of active Scheme members earn less than £55,000³ meaning the vast majority are accruing DB on all their earnings.
- The Scheme has a number of unique features. Its relative immaturity means that it is cashflow positive (i.e. its current income exceeds its outgoings) and, all other things being equal, is projected to remain so for the next 50 years. Crucially, the strength and long-term nature of the higher education (HE) sector and its participating employers mean that, unlike the vast majority of occupational Scheme trustees, the USS Trustee can afford to take a very long-term view. This is particularly so given that, over the next 20 years, USS expect the size of the Scheme to fall relative to the size of the sector. This is mainly due to the changes made to Scheme benefits in 2016 which mean that final salary benefits will gradually fall away and be replaced by CARE benefits capped at CPI growth.
- The Scheme's governance arrangements also contain a number of unique features. The determination of benefits and how costs are shared falls to the Joint Negotiating Committee (JNC), which sits outside the remit of the Trustee. The Trustee has the sole power under the Scheme Rules to set the employer contribution rate (subject to consultation). A further feature of USS is that it shares risk with Scheme members through the cost-sharing rules which are applied when the Trustee determines that there should be an increase in the aggregate amount of contributions.

³ <https://www.uss.co.uk/~media/document-libraries/uss/Scheme/uss-investment-builder-a-summary-of-research.pdf>

ASSESSMENT OF THE 2017 VALUATION – METHODOLOGY, ASSUMPTIONS AND TESTS

- In considering its approach to an actuarial valuation it is reasonable for any scheme to assess contribution affordability; investment return; and availability of employer assets to support the scheme in extremis. The Pensions Regulator (TPR) has encouraged trustees to adopt this approach. These considerations are reflected in the three Tests used by the Trustee: manageable distance to self-sufficiency in 20 years' time (Test 1); stability of contributions (and/ or benefit design) (Test 2) and the ability of the sector to underwrite the Scheme in a disaster scenario (Test 3).
- The Panel has spent a significant amount of time understanding and assessing the three Tests, and Test 1 in particular. The Panel has concluded that the outputs of Test 1, while very specific and quantitative, are highly sensitive to the input assumptions, many of which are very subjective. Consequently, we believe that Test 1 is given too much weight in determining the valuation and its effects extend beyond its original purpose. Rather than being used as a "stop-and-check" reference point, Test 1 is being used as a constraint on benefit design and driver of investment strategy. The Panel does not consider this helpful. It would be far better if Test 1, were its use to continue, was used as a test that informed other aspects of the valuation and funding strategy rather than acting as its lynchpin. By contrast, Tests 2 and 3 appear not to play a significant role in either the valuation or the on-going monitoring. Yet Tests 2 and 3 reflect considerations which are important to stakeholders and the long-term prospects of the Scheme.
- Whilst the specificities of the Scheme and the strength and diversity of the HE sector appear to have been taken into account in some areas, this has not always been the case. In particular, the Panel believes that insufficient weight has been given to the fact that USS is a large, open, immature scheme which is cashflow positive and can adopt a very long time-horizon. By giving this strength and diversity a greater weight, the Panel believes that the Trustee and the employers may be able to agree a larger risk envelope.
- The Panel is of the view that **self-sufficiency** is a useful concept as an element in a test. It provides a reference point for judging whether a scheme is over-reliant on the sponsor covenant. However, the way in which the employers' risk appetite has been applied through Test 1 has contributed to the adoption of strong risk aversion. The Panel's view is that adopting a time horizon of 20 years (used for assessing the gap between technical provisions and self-sufficiency) and the hypothetical move to a low-

volatility, low return portfolio is only one of many paths available for a scheme with the strong, long-term, prospects and unique characteristics of USS.

- Overall, this approach dampens perceptions of the outlook for the Scheme which, in the Panel's view, is strong.
- The Panel considers that in a scheme of USS's size and assets under management, it is appropriate for the Scheme to develop its own model for establishing **economic and investment outcomes**. The Panel has identified no concerns about the Fundamental Building Blocks (FBB) approach.

THE VALUATION PROCESS AND GOVERNANCE

- One of the unique features of USS is its governance structure. Amongst other things, this gives the Trustee unique powers through a unilateral right to set contributions (subject to consultation). It is beyond the scope of this report to examine whether this should change, but clearly the process does need to be managed more effectively in terms of interaction with, and gaining the support and confidence of, employers and members.
- It is reasonable in a scheme as large as USS that the Pensions Regulator (TPR) should be kept informed during the valuation process. This is consistent with TPR's risk-based approach to regulation. However, some of those giving evidence to the Panel have suggested that the Regulator's views have steered employers' decisions.
- TPR appears to have taken an approach to the valuation, especially in relation to the employer covenant, that does not fully take account of the specificities of USS. In particular: the very long-term nature of the Scheme; its relative immaturity and cashflow-positive status; and the fact that it is a 'last man standing' scheme.
- The excessive complexity of the valuation has raised a number of issues relating to the clarity of communication with employers and Scheme members as well as the process, content and timing of consultations with employers.
- With respect to assessing employer covenant, the Panel acknowledges it is not a simple task to consult with 350 different institutions or to ascertain their risk appetite – a consultation will inevitably generate a wide range of views and possible outcomes. However, the framing and context of the questions asked of employers have, in our view, produced misleading results. These results have been distilled into a single number which feeds into Test 1, and which in turn affects contribution requirements,

future Scheme benefits, the investment strategy and the estimated deficit. These are outcomes which, on exploration, appear to be inconsistent with many employers' wishes.

- Employers have been asked questions in consultations and questionnaires that have not fully explored the consequences or trade-offs of the issues under investigation. It is debatable whether employers have been able to give fully informed answers to important questions. In addition, timeframes for consultations have sometimes been very short, with the result that it has not always been possible for employers to consider and debate thoroughly the issues under consultation, particularly in the many universities with complex governance structures.
- There has been a large volume of information relating to the valuation placed on the USS website. This has, in part, been in response to member requests and shows a desire on the Trustee's part to operate in an open and transparent way. However, much of this information is extremely technical and complex in both language and content. It is very unlikely, despite the high educational attainment levels of USS members, that this material has been well understood by Scheme members. Volume is not a substitute for good quality information that can be understood by all. The lack of understanding is likely to be a contributing factor to falling levels of member confidence in the Scheme.
- There is no formal mechanism for involving Scheme members in the valuation process or assessing their appetite for risk. This is of great relevance in the USS context given the existence of cost sharing when additional contributions are required. It is beyond the scope of this report to consider how member involvement could be achieved, but this is an unresolved issue for the management of the Scheme.

CONCLUDING THE 2017 VALUATION

- The 2017 valuation process commenced almost two years ago. Much has happened in the intervening period, not least a protracted period of negotiation, and an industrial dispute which led ultimately to the creation of the JEP.
- Our ToR restrict us to commenting on the 2017 valuation. The Panel has made a number of observations about the valuation assumptions and methodology which, if agreed, would mean that the outcome could be different, thereby enabling all parties to move forward quickly. In addition, there have been a number of post-valuation developments, including the availability of new data which, if applied, would influence the outcome of the valuation.

- The Panel has developed five principles against which adjustments could be considered:
 1. A re-evaluation of the employers' willingness and ability to bear risk – this would mean re-assessing the reliance on sponsor covenant.
 2. Adopting a greater consistency of approach between the 2014 and 2017 valuations – this would mean changing the approach to deficit recovery contributions.
 3. Achieving greater fairness and equality between generations of Scheme members – this would mean smoothing future service contributions.
 4. Ensuring the valuation uses the most recently available information – this would mean using latest available data and taking account of recent investment considerations and outcomes.
 5. Taking the uniqueness of the Scheme and the HE sector more fully into account.
- The Panel believes that making adjustments in each of these areas would have a material impact on the scale of the 2017 deficit and resulting contribution increases. We also believe this would create a space within which employer and members can find common ground so that the issues around the valuation can be reconciled. It is also our view that the adjustments proposed are consistent with the Trustee's fiduciary duties and the objectives of the Regulator.
- If agreed and implemented, these changes would avoid the need for the very steep contribution increases envisaged in the Scheme Rule 76.4-8 (cost-sharing) process. This would create the space for the stakeholders, through the JNC, to consider some of the longer-term issues facing the Scheme and establish a stable platform for a further review of the Scheme by the Panel.

LOOKING AHEAD

- In the time available to it, the JEP has undertaken a thorough examination of the methodology, tests and assumptions used in the 2017 valuation. We have provided commentary on their application and the overall approach to the valuation adopted by the Trustee. We have also made recommendations as to revisions to the 2017 approach that would enable the 2017 valuation to be concluded, whilst creating some space for the Trustee and JNC to consider the necessary short and longer term reforms to the Scheme.
- However, it is clear that there are a number of issues that remain to be resolved. Whilst the JEP has commented on the many elements of the valuation, we have not opined on

whether there is a different way of reaching a conclusion that could provide long-term stability to the valuation process and have the support and confidence of all parties. The Panel believes this should be a core element of the second phase of its work.

- The second phase of work should also include a wider review of the approach and involvement of UUK and UCU in future valuations so that a more collaborative approach can be adopted and industrial action, such as that witnessed earlier this year, can be avoided. This would require examining the interaction of the various bodies with a formal role in the valuation process; considering the potential for the involvement of Scheme members in the valuation process; and considering how more effective engagement with employers can be achieved.
- We have recommended that in view of the need to start to prepare for the 2020 valuation, work on Phase 2 should start as soon as possible. However, this work will require a firm foundation and cannot, therefore, be concluded until the 2017 valuation itself is concluded.

3. THE JEP'S WORK PROGRAMME AND EVIDENCE BASE

WORKING METHODS

The Joint Expert Panel (JEP) met 11 times between May and September 2018. Membership of the JEP comprises three members appointed by UCU and three by UUK, together with an independent chair. Together, the members of the Panel brought a wide range of experience and expertise to their task. This was invaluable in assessing the evidence and developing our conclusions and recommendations. A full list of members and the secretariat is set out at Annex 1. The ToR required two members nominated by UUK and two from UCU to be present at each meeting. Each meeting was quorate.

The Panel recognised the considerable interest in its work from Scheme members and sponsoring employers. It provided a summary of each meeting and this was posted on the UCU and UUK websites within seven working days of each meeting.

OUR EVIDENCE BASE

The Panel has taken an evidence-based approach to developing its analysis of the Scheme and the valuation. It is this evidence which has driven the Panel's assessment of the 2017 valuation and the conclusions and recommendations in this report. The Panel has also sought to evidence the conclusions it has reached, and is aware of the importance attached by Scheme members and sponsoring employers to this.

We have been pleased that the Trustee has engaged actively with the JEP. It has shared a large volume of information. The JEP took evidence from Professor Sir David Eastwood, Chair of the Trustee; USS Group CEO Bill Galvin; and a range of senior USS executives who answered the questions put to them by the Panel. In addition, the Panel heard evidence from advisers to the Trustee and stakeholders as well as other parties, including The Pensions Regulator (TPR). These meetings covered a range of topics encompassing the methodology, the financial and non-financial assumptions, USS's governance arrangements, the covenant, the process for undertaking the valuation and its communication to members and employers.

In addition to discussing and providing information already in the public domain (and which is mainly held on the USS website www.uss.co.uk), USS has made available to the JEP further information much of which is commercially confidential and/or has been provided to the Trustee by a third party. In these cases, permission was sought and granted to release

this information to the JEP. The Trustee actively facilitated this for the Panel. This additional information has been invaluable in helping the JEP undertake its assessment of the 2017 valuation. The Panel is extremely grateful to the Trustee for its co-operation and willingness to share information. Where it is relevant to our findings and recommendations we have referred to this information and quoted extracts from it (having first obtained the necessary permissions).

Figure 2: Evidence used

- Documents available in the public domain and made available by the Trustee on its public website.
- Presentations to, and discussions with, the Panel from the USS Executive and the Board of Directors.
- Documents made available to the Panel by the Trustee and its advisers which are not in the public domain.
- Presentations to and discussions with the Panel by the Trustee's advisers.
- Documents made available to the Panel by TPR.
- Presentations to and discussions with the Panel by TPR.
- Documents made available to the Panel by advisers to UUK and UCU (although, importantly, without the approval or authorisation from UUK or UCU to their respective advisers' inputs).
- Presentations to and discussions with the Panel by UUK's and UCU's advisers.
- Papers made available through the Panel's call for submissions.
- Other documents relating to DB pension schemes in the UK, DB scheme regulation, and the HE sector.
- Analysis of the valuation assumptions by AON and First Actuarial, the actuarial advisers to UUK and UCU, respectively.
- Further analysis by USS on how the valuation assumptions are derived.

The Panel also commissioned additional independent analysis of the assumptions underlying the valuation from First Actuarial and AON, actuarial advisers to UCU and UUK respectively. This report was provided independently by the two firms without the input or involvement of UCU and UUK. The purpose of this work was to explore the areas where there could be scope for flexibility in the valuation assumptions. The output of this work is covered in Chapter 8.

We also asked the Trustee to undertake further analysis for the Panel. This focused on providing further detail on the assumptions underpinning the valuation.

SUBMISSIONS TO THE PANEL FROM STAKEHOLDERS

The Panel believed it was important that Scheme members and sponsoring employers had the opportunity to influence the work of the JEP. Therefore, the Panel actively sought evidence and views from stakeholders and other commentators.

The Panel set up an email account for this purpose – submit@ussjep.org.uk – and was clear that all submissions would be treated confidentially so that stakeholders could freely express their views and share information with the JEP. All submissions were carefully considered and where relevant are reflected in our analysis and recommendations. The Panel is very grateful to all those who took the time to provide evidence.

Fifty five unique submissions were received. Twelve came from institutions and the balance from Scheme members and other interested parties.

There were a number of common themes:

- A number of submissions commented on the design of Scheme benefits.
- Many focused on the unique nature of the HE sector and the Scheme and thus the Trustee's ability to take a longer-term view.
- Some were concerned with the broader question of DB funding and regulation as well as the broader economic conditions impacting schemes.
- Many of the submissions focused on the valuation methodology, in particular the investment strategy, the level of assumed risk and assumptions, covenant assessment, prudence, and the three tests that underpin the valuation, notably Test 1. Whilst some suggested that the three tests – and Test 1 in particular – are fundamentally flawed and overstated the deficit (with some suggesting the Scheme is, in fact, in surplus), a few others suggested that the Trustees were understating the level of deficit.
- A large number of submissions encouraged the JEP to seek the co-operation of the Trustee and full disclosure of relevant documentation. As noted earlier in this report, the Panel received positive engagement from the Trustee.
- Several submissions raised broader issues relating to UK and EU legislation and accounting standards which have affected Scheme funding.
- Some of the issues raised in the submissions are outside the scope of this phase of the JEP's work. Others may be more appropriately addressed in the second phase of the Panel's work.

The volume of submissions highlight the importance Scheme members and sponsoring employers attach to the Scheme and the value they place in its benefits.

ORAL EVIDENCE SESSIONS

The JEP also took oral evidence from a number of parties, in particular those who were influential in the decision-making relating to the valuation. This additional questioning allowed the Panel to gain further insight into a number of aspects of the valuation and, in particular, to probe information not in the public domain. We also invited some academics to clarify their written submissions to the Panel.

Figure 3: JEP work programme

Meeting	Date	Topic
1	31 May	Welcome, introductions, JEP working methods, evidence pack, ToR
2	6 June	'Discovery meeting' – USS valuation Oral evidence session 1 with USS Executive
3	7 June	'Discovery meeting' – USS governance Oral evidence session 2 with USS Executive Oral evidence session 3 with TPR
4	22 June	Oral evidence session 4– First Actuarial Oral evidence session 5- AON Assessment of 2017 valuation
5	28 June	Assessment of 2017 valuation
6	9 July	Oral evidence session 6 – Chair of Trustee Oral evidence session 7 – Professors Miles and Gandy Oral evidence session 8 – EY Parthenon Revisit 2017 assumptions
7	23 July	Revisit 2017 Assumptions Oral evidence session 9 – USS Executive and Scheme Actuary
8	9 August	Oral evidence session 10 – PwC Oral evidence session 11– First Actuarial & AON Consideration of how to conclude the 2017 valuation
9	29 August	Draft report review and comment
10	3 September	Report review and comment
11	12 September	Report finalisation and sign off

4. DEFINING THE ISSUES

This chapter sets out the ToR for the JEP that were set out by UUK and UCU. It goes on to describe how the Panel has interpreted the key requirements of the ToR.

The JEP was established under an agreement reached between the UCU and UUK through the Advisory, Conciliation and Arbitration Service (ACAS) on 23 March 2018. This sought to provide a mechanism through which the 2017 valuation, processes, methodology and assumptions could be assessed, and principles for agreeing a joint approach to future valuations agreed.

This creation of the JEP followed an extended period of negotiations, facilitated by ACAS, which had seen industrial action over pensions during the early part of 2018.

The ToR for the JEP were proposed by ACAS, agreed by both parties and finalised by the JEP Chair in discussion with Panel members. The Terms of Reference are set out in full in Annex 2. The text of the ACAS agreement of 23 March 2018 is attached as Annex 3.

In particular, the JEP Terms of Reference call on the Panel to:

- *Make an assessment of the 2017 valuation (paragraph 5 of the ACAS agreement)*
- *Focus in particular on reviewing the basis of the Scheme valuation, assumptions and associated tests (paragraph 4 of the ACAS agreement); and*
- *Agree key principles to underpin the future joint approach of UUK and UCU to the valuation of the USS fund (paragraph 1 of the ACAS agreement).*

The Terms of Reference identify two phases to the JEP's work programme:

- *The Panel will aim to submit a report to UUK and UCU in September 2018 that meets the purpose described above in relation to the 2017 valuation. (Phase 1.)*
- *The Panel will provide a follow up report that meets the purpose described above in relation to the USS valuation process in general. This follow up report will relate to valuations after the 2017 valuation. (Phase 2.)*

Whilst some of our analysis and conclusions touch upon the issues raised for Phase 2 of the JEP's work, this is out of scope for the purposes of this report.

There are a number of other issues concerning the Scheme which do not fall to the JEP (see Figure 4). They are, primarily, the remit of the JNC. It should also be stressed that it is not the role of the JEP to adopt the role of negotiator in relation to the Scheme's benefit structure. That is properly the concern of the JNC.

Figure 4: JEP Terms of Reference – in scope and out of scope (Phase 1)

In scope	Out of scope (in Phase 1)
Assessment of the 2017 valuation	Negotiation of new benefits structure
Reviewing the basis of the Scheme valuation, assumptions and associated tests	Comparison with Teachers Pension Scheme
Agreement of principles to underpin future valuations	Alternative scheme design
To take account of: the unique nature of the HE sector; intergenerational fairness and equality; the need to strike a fair balance between ensuring stability and risk; and the current legal and regulatory framework.	Role of the UK government in relation to USS
	Reform of the negotiating process
	Future valuations and their methodology

To enable the JEP to focus on the key issues relating to Phase 1 – not least in light of the very tight timetable to which the JEP was working – we designed Phase 1 as follows:

- **Part 1:** a retrospective review of the 2017 valuation (to date). To include an assessment of the methodology, assumptions and process.
- **Part 2:** within the 2017 framework, to explore the scope for possible revisions to the methodology and/or assumptions to allow the 2017 valuation to be completed without invoking rule 76 of the Scheme’s Rules.

Our assessment of Part 1 is covered in Chapter 6 and our assessment of Part 2 in Chapter 8.

DEFINING THE TERMS OF REFERENCE

The ToR call on the JEP to have particular regard to the following issues when undertaking its assessment of the valuation:

- The unique nature of the HE sector.
- Intergenerational fairness and equality considerations.
- The need to strike a fair balance between ensuring stability and risk.
- The current legal and regulatory framework.

These are concepts open to a variety of interpretations. The JEP has considered them in the following way.

THE UNIQUE NATURE OF THE HIGHER EDUCATION SECTOR

The HE sector has a unique place in the UK economy. It contributes £10.8bn a year to UK export earnings and generates around 207,000 jobs⁴. The sector generates £33bn in income each year⁵. Importantly too, for the UK and USS, the HE sector is world-leading, being home to 46 out of the world's top 400 universities according to the Times Higher Education Rankings 2015. Further, demand for places continues to outstrip supply, with the ratio of applicants to acceptances standing at 1.35⁶. The Panel has been told that the UK HE sector is "in a uniquely attractive commercial position"⁷.

The sector is also distinct in not having shareholders to satisfy. Whilst some institutions may have, for example, bondholders who may have a call over assets, and sponsoring employers may have other calls on available capital the fact that dividends do not have to be paid removes a source of external pressure on sponsoring employers. This is not the case for many other employers supporting occupational pension schemes outside the HE sector. This unique nature has implications for the long-term prospects for USS, the Scheme members and sponsoring employers.

The HE sector in the UK has undergone significant change over the past 30 years. It will continue to do so as it meets the opportunities and challenges in the near future (e.g. restrictions on numbers of foreign students and competition from private institutions). While the shape and structure of the sector is expected to continue to adapt and some individual institutions may not survive in their current form, as a whole it is expected to have a strong future. Indeed, evidence prepared for the Trustee by EY Parthenon and provided to the Panel has suggested that even those individual institutions under severe stress are able to adapt expenditure in line with enrolments. In the rare event that an institution fails, experience suggests that it will merge with another, stronger, institution. Even where merger does not occur, students will take up places in another institution with the result that fees, and hence income to institutions, are not lost to the sector.

Furthermore, the Scheme's liabilities are not spread evenly across sponsoring employers. According to the EY Parthenon analysis, 54% of the Scheme's liabilities attach to broad-based research institutions (defined by EY Parthenon as being "Russell Group plus Oxbridge, UK universities with a strong research focus"). These institutions are financially the strongest in the sector, according to PwC's analysis (see Annex 6 for further information).

⁴ The Economic Impact of International Students. UUK. May 2017

⁵ EY Parthenon report prepared for JEP based on USS report. Source data HESA

⁶ EY Parthenon report prepared for JEP based on USS report. Source data UCAS

⁷ EY Parthenon oral evidence to the JEP

Ultimately, therefore, it is the overall strength of the sector, as opposed to that of individual institutions, which matters most in the context of the USS. This is particularly so given the Scheme's 'last man standing' arrangement, the principles of mutuality that underpin the Scheme's funding and contribution base, as well as the pooling of risk that insulates the Scheme in a way that is not possible in a single employer or other multi-employer scheme. The diversity of business models and financial strength across the institutions that sponsor USS acts as both:

- a strength in reducing overall systemic risk and ensuring the long term sustainability of the sector; and
- a challenge, not least in managing the potential cross-subsidies between institutions which sponsor USS and their divergent interests in the governance of the Scheme.

The differences in business models have been reflected in recent discussions on the level of investment risk that different institutions wished the Trustee to adopt and the desire on the part of some institutions to limit cost volatility.

Analysis prepared by the executive of the Trustee and shared with the Panel suggests that the sector would be reasonably resilient to a sudden shock. They modelled what would happen if the Scheme instantaneously contracted by 20% in membership and payroll as at 31 March 2017 with current benefits maintained. This shows the deficit would increase from £7.5bn to £7.8bn with the future service rate needing to increase by +0.3% of payroll, and deficit contributions by +1.6% (assuming no changes to the recovery plan). Further information is set out in Annex 8.

INTERGENERATIONAL FAIRNESS AND EQUALITY

The issues of intergenerational fairness and equality are complex but very relevant to the outcome of the 2017 valuation. There have been concerns that measures to address the Scheme deficit and future service contributions, including new Scheme designs, will create intergenerational unfairness with future generations being forced to pay for promises made in the past. Conversely, over-prudent valuation and contribution-setting would, on average, mean that contributions overpay for benefits. This may lead to a reduction in contribution rates for future generations and a release of surplus investment return.

We share these concerns, but recognise there is no simple remedy. We will not know if there has really been a cross-subsidy between generations of members until after the event. The Panel believes that it is unlikely that any outcome can provide complete fairness between generations.

There is no easy basis on which to assess the intergenerational fairness of fast versus slow deficit recovery. It might be thought that fast recovery is fair because it increases the likelihood that members with the largest accrued rights will bear the brunt of the deficit recovery contributions (DRCs). However, the impact of DRCs on Scheme members is uncertain. Employers (who pay DRCs in the first instance) might respond to extra costs by restraining pay, or they might curtail recruitment at entry level.

Similarly, in respect of future service contributions, achieving stability of future service contributions is helpful from an intergenerational perspective.

Nevertheless, the valuation outcome in terms of contributions and/or benefits should not place a disproportionate burden or advantage on one generation of Scheme members over another. Moreover, it should not make the Scheme appear unattractive to particular cohorts of members with the result that they opt out of the Scheme in large numbers.

A FAIR BALANCE BETWEEN STABILITY AND RISK

The Panel takes this to mean that employers (in particular) wish to have confidence about the range within which the cost of providing benefits over the short and long term. Members also desire stability in contribution levels and a stable benefit structure that delivers a reasonable income in retirement.

However, achieving a balance between stability and affordability is not simple and, given volatility in financial markets and uncertainty over key parameters such as longevity, pensions cannot be made risk-free. A collective and employer-backed DB scheme, such as USS Retirement Income Builder, offers a better balance of stability and risk than an individual DC scheme. This is partly achieved by risk-sharing among members, whereby members can obtain collectively the long-term expected investment returns without experiencing individually the short-term volatility of those returns. Similarly, members in the Retirement Income Builder benefit from longevity risk-pooling.

Furthermore, members gain from the 'tail risk' insurance provided by the employer covenant. However, providing this insurance has costs for employers, as it introduces uncertainty over future costs and may, for example, affect their ability to borrow for future investment. In deciding how much insurance to offer, employers have to weigh up the value of the security they provide to members against the cost to future investment plans.

A key principle in weighing up how much risk to take is that accepting risk should bring rewards in the form of higher expected investment returns. This may allow benefits to be sustained without burdensome levels of contributions. Following an investment strategy which reduces the short-term volatility of the Scheme's assets may well not achieve the

desired stability over the long-term as the opportunity to exploit the inter-generational, collective structure of the Scheme and seek higher investment returns is lost.

The Trustee must also consider the negative impact of some key risks: the risk of investment returns being below the Trustee's expectations over an extended period of time; the risk that some or all employers within the Scheme will not survive and hence the risk to the Scheme's employer contribution base; and that Scheme members live longer than expected, meaning that their benefits must be paid for longer than expected. These risks must be managed by assessing the employer covenant, choosing an investment strategy, and setting contributions appropriately. In the case of USS, they have also been managed through changes in the benefit structure (notably, the cessation of a final salary basis for benefits and its replacement by CARE), negotiated by the employers and the union.

THE CURRENT LEGAL AND REGULATORY FRAMEWORK

In assessing the draft valuation, the Panel has been clear that the Trustee must satisfy the current legal and regulatory requirements as set out in primary and secondary legislation and have regard to TPR's codes and guidance. In particular this means:

- The Pensions Act 2004 and the Occupational Pension Schemes (Scheme Funding) Regulations 2005 (SI 2005/3377).
- The Regulator's codes and guidance, notably: Code of Practice No 3: Funding defined benefits (2014); Code of Practice No 1: Reporting breaches of the law (2005); Code of Practice No 2: Notifiable events (2005); Code of Practice No 9: Internal controls (2006); and its guidance relating to Integrated Risk Management (2015)⁸.

We note that the Regulator's codes of practice are not statements of law. The Regulator additionally states that: "It is not necessary for all the provisions of a code of practice to be followed in every circumstance."⁹

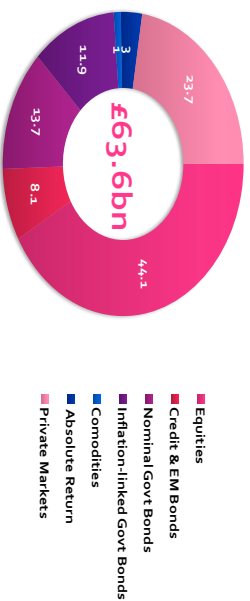
The Panel has only considered approaches to the valuation that would satisfy the current legal and regulatory framework.

⁸ Available on the Pension Regulator's website: www.thepensionsregulator.gov.uk

⁹ Code of practice no 3: Funding defined benefits. The Pensions Regulator, July 2014

5. ABOUT USS

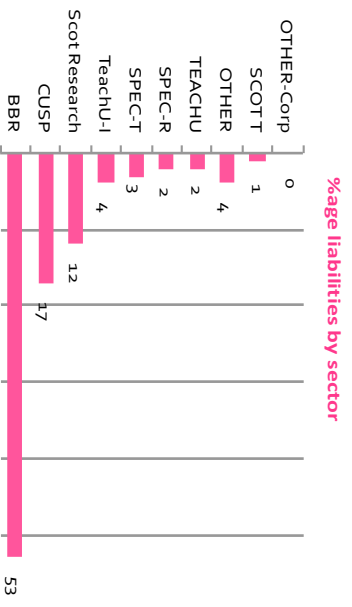
USS is the largest scheme in the UK by assets under management:



As at 31 March 2018

£67.5bn Liabilities
As at Sept 2017

But liabilities are not spread evenly across the sector. The majority of liabilities sit with the strongest universities

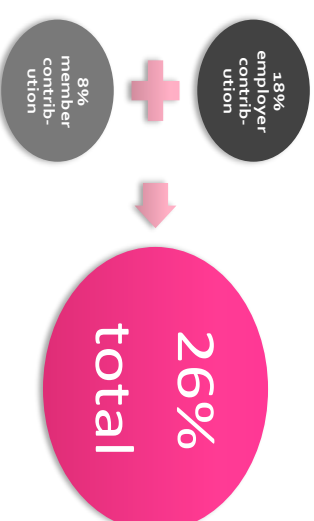


Other = corporates and charities; SCOTT = Scottish teaching; Other = other; Teaching U = Teaching universities; SPEC-R = specialist research institutions; SPEC-T = specialist teaching universities; TeachU-I = teaching universities international; Scot Research = Scottish research universities; CUSP = Cusp university; BBR = Broad based research universities.

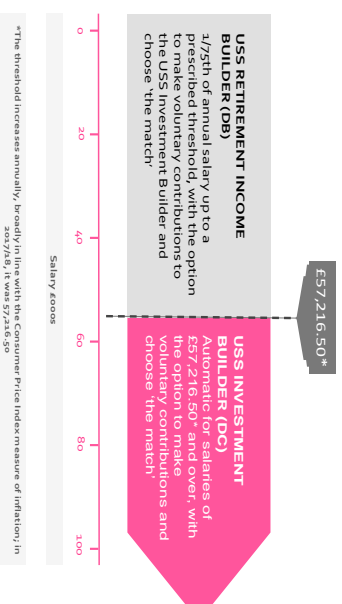
It is also one of the largest by numbers of members*:

418,964 – total
198,652 – actives
151,119 – deferred
69,193 – pensioner
* As at 31 March 2018

Contributions are paid by members and employers



It provides a mix of defined benefit and defined contribution benefits



6. JEP ASSESSMENT OF THE DRAFT 2017 USS VALUATION

SUMMARY

- The Panel has invested considerable time understanding the methodology employed by the Trustee for the 2017 valuation, in particular, Test 1. Test 1 is highly complex and the explanations are highly technical in nature leading to uncertainty over whether stakeholders have a clear understanding of the impact of the Test.
- Whilst a test of self-sufficiency and employer reliance is a useful principle for the basis of a valuation, Test 1's formulation, application and implementation is very rigid with the result that Test 1 has led to a valuation that is model-driven rather than model-informed. As suggested by other commentators, alternative ways of arriving at a valuation of technical provisions are open to USS and should be explored.
- Test 1 drives the investment strategy towards a low return investment strategy that results in a higher deficit and higher contributions than would be the case if the current investment strategy were maintained.
- The Panel believes that the Scheme's advisers have put forward a clear, reasoned, well-evidenced and positive analysis of the sector which provides overwhelming support for the Trustee's the assessment the view that the covenant is strong.
- However, it is not clear that the employers' appetite for risk has been assessed appropriately, particularly in relation to the delicate balance between investment risk, funding levels and contribution levels.
- USS's approach to meeting Test 1 implies a de-risking of assets. A number of other paths are open to USS and could be explored.
- The assumption of gilt yield reversion has become the focus of attention for some critics who believe that USS's assumptions are too optimistic. However, so long as USS holds a diversified (i.e not 'de-risked) portfolio, the failure of gilt yields to revert will be accompanied by a change in the expected returns on other assets. The assumption of reversion is by no means as critical as some observers believe.

This section of the report summarises the JEP's assessment of the draft 2017 valuation as required by the Panel's ToR. It sets out the Panel's understanding of each aspect of the valuation methodology and assumptions and then separately describes the Panel's views on each aspect.

The Panel began its assessment by examining the overall methodologies employed by USS to do the valuation, which consisted primarily of Test 1. It then considered the financial and demographic assumptions employed in the valuation and, finally, the process by which the

valuation was communicated with stakeholders by the Trustee (a subject which is covered in Chapter 7 of this report).

In assessing the valuation, the Panel has asked itself the extent to which the outcome:

- Is affordable to all parties while providing broadly comparable benefits?
- Is fair across generations?
- Balances stability and risk?
- Satisfies the current regulatory requirements?

The views of the Panel on these points in particular are summarised at the end of the chapter.

UNDERSTANDING THE METHODOLOGY

The Panel has invested considerable time understanding the methodology employed by the Trustee for the 2017 valuation. At one level, the methodology is the same as that employed by all DB Schemes and requires:

- the assets of the Scheme to be valued at current market values;
- accrued liabilities to be valued by discounting the benefits due to be paid by a prudent rate (as required by law) and applying other prudent assumptions (e.g. for how long members might be expected to live) to deliver a current value called the Technical Provisions (TPs); and
- the resulting surplus or deficit (or very rarely, equilibrium) then informs whether the statutory funding objective has been met or whether a recovery plan is needed to address the deficit.

The valuation also provides the basis for calculating future service contribution (FSC) rates to fund benefits accrued in the future.

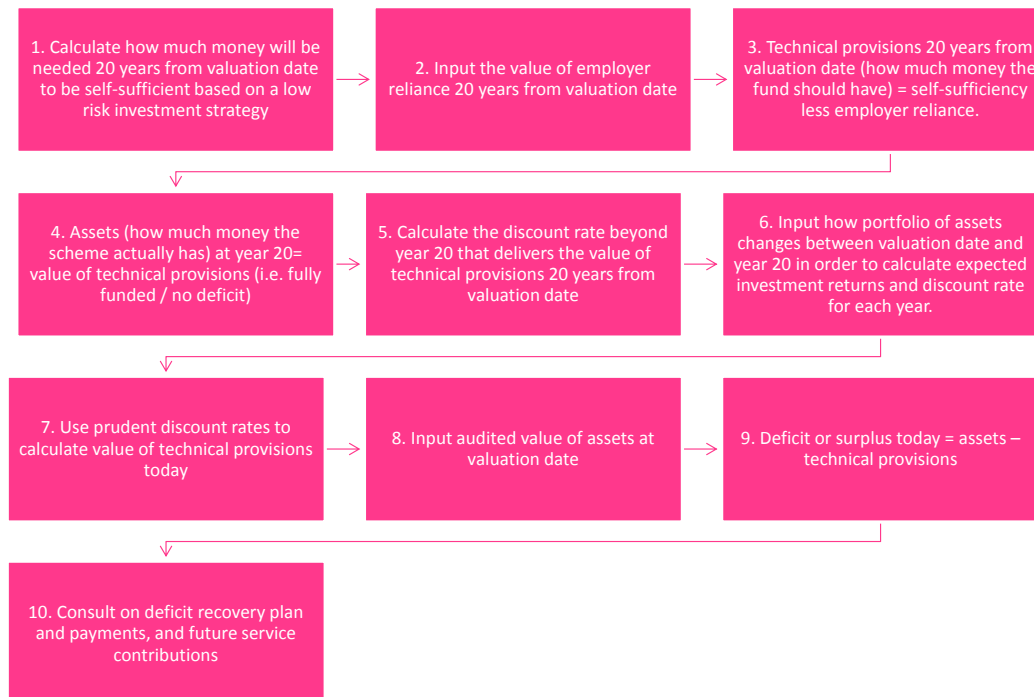
The USS valuation methodology is described in detail in documentation available on the USS website¹⁰. The methodology reflects the Trustee's approach to the requirement by TPR for schemes to adopt an integrated view of the risks facing the scheme (called Integrated Risk Management, IRM) specifically investment, covenant and funding risks.

The core part of the valuation methodology adopted by USS is reflected in three tests. One of them, Test 1, is determining, rather than simply testing, a number of the assumptions used in the valuation. In particular, the future investment strategy and hence the discount

¹⁰ USS. Methodology and Inputs for the 2017 Valuation: Initial assessment. Technical document for sponsoring employers. 17 February 2017

rate used to value the liabilities at the valuation date (on the TPs) basis) are derived from Test 1. The Panel's understanding of Test 1, as employed in the 2017 valuation, based on documents and presentations provided by the Trustee, is summarised in Figure 5.

Figure 5: A high level, simplified schematic describing Test 1



In application, the Test is an iterative process. The required rate of contribution indicated by the valuation can change the value of the employer reliance and thereby drive a further iteration of Test 1, as suggested by USS in its September consultation with employers:

*"An increase in regular contributions from 18% of pay to c 22% of pay, reduces the ability to pay contingent contributions by 4% of pay and so reduces the maximum reliance that can be supported. The consequences of reducing the contingent contributions to this degree would need careful consideration given the complex iterative calculations required."*¹¹

Tests 2 and 3 are more clearly tests and do not appear to play a significant part in the outcome of the valuation:

- Test 2 was originally constructed to measure the degree of stability in contributions, in particular whether contributions could be maintained within certain bounds,

¹¹ USS. 2017 Actuarial Valuation. A consultation with Universities UK on the proposed assumptions for the Scheme's technical provisions and Statement of Funding Principles. 1 September 2017

employing gilt returns as the basis for the calculation. Because of the volatility being introduced through the use of Test 1 (and market conditions), USS notes in its September consultation with employers that the construction of Test 2 is due to be changed to monitor the required contribution rate on the basis of the Scheme's expected returns.

- Test 3 is designed to ensure that the assets of the sector are sufficient to cover the benefits accrued at any point in time.

The Panel's views of the overall methodology are that:

- The tests, in particular Test 1, have been devised in response to changes in TPR guidance. USS has attempted a sophisticated approach to IRM, in line with TPR best practice, which theoretically is attractive.
- The explanations of Test 1 are highly technical in nature leading to uncertainty over whether stakeholders have a clear understanding of the impact of the Test. The view of the Panel is that Test 1 is not well understood outside of USS.
- While a test of self-sufficiency and employer reliance is useful, Test 1's formulation, application and implementation is overly influential for an open scheme, particularly one supported by the sector's unique features. As suggested by other commentators, alternative ways of arriving at a valuation of technical provisions are open to USS and should be explored.
- Rather than being used as a "stop-and-check" reference point, Test 1 is being used as a constraint on benefit design and a driver of investment strategy. The Panel does not consider this helpful.
- Test 1 drives the investment strategy towards a low return investment strategy that results in a higher deficit and higher contributions than would be the case if the current investment strategy were maintained. Other options may be available to an open scheme with a unique covenant such as USS.
- Tests 2 and 3 appear not to play a significant role in either the valuation or the on-going monitoring and yet are important for stakeholders and the long-term prospects for the Scheme. In particular, they open up the possibility that reliance on the covenant could be assessed differently. While the recommendations for this phase of work do not investigate the role of contingent assets or negative pledges, this may be an issue that merits future investigation.

In the following sections, we explore in more detail steps 1,2 and 6 in Figure 5 as they are key steps in the valuation process.

SELF-SUFFICIENCY (STEP 1)

Self-sufficiency is defined by the Trustee as “the value of the assets required to meet the Scheme’s accrued defined benefit liabilities while adopting a low risk investment strategy. By a low risk investment strategy, we mean one for which there is a low probability of ever requiring additional employer contributions to fund benefits earned to date”¹². For the 2017 valuation, “low” is defined as a less than 5% probability of the Scheme running out of money before all liabilities are paid.

Test 1 begins with the concept of self-sufficiency at a date in the future. The date in the future is defined as 20 years from the valuation date (also known as the reliance horizon in USS documentation). It is determined as the date at which the Trustee can be confident in the sponsoring employers still being able to support the Scheme. For example, for a valuation date of 31 March 2017, the self-sufficiency valuation is done as at 31 March 2037. That does not mean that the Trustee expects employers to be unable to support the Scheme after 31 March 2037. Rather, it is that the Trustee, based on the covenant assessment undertaken by PwC (as summarised in Annex 6), feels much less sure what the sector will look like beyond the 20-year horizon.

Self-sufficiency in Test 1 is based on the benefits accrued to, for example, 31 March 2037 only. The self-sufficiency assessment assumes that a low volatility, low return investment strategy is followed after 31 March 2037 to justify a gilts-based discount rate. The use of a gilts-based discount rate to value self-sufficiency has important ramifications for the valuation of technical provisions in 2017, the value of the deficit and for setting the future service contribution rate; these are discussed below in the Panel’s views on self-sufficiency.

The self-sufficiency estimate of the level of liabilities is determined by an assumed investment portfolio that is low in expected volatility and return. It is defined as a portfolio of mostly fixed income assets. These are expected (in 20 years’ time) to be yielding an annual return equivalent to projected gilt yields + 1.2% per annum¹³. Gilt yields in 20 years’ time are assumed by the Trustee to have returned to the type of yield experienced in 2014, rather than today’s lower levels. To build safety into the estimate of self-sufficiency, this return is adjusted to a discount rate of gilt yields +0.75% when calculating liabilities on a self-sufficiency basis.

¹² USS. 2017 Actuarial Valuation. A consultation with Universities UK on the proposed assumptions for the Scheme’s technical provisions and Statement of Funding Principles. 1 September 2017

¹³ USS presentation to JEP June 2018

The Panel's views of self-sufficiency are that:

- Self-sufficiency is a useful concept. It provides a reference point for judging the extent of reliance on the employer covenant and whether the Scheme has sufficient funds either from its assets or that can be called upon from employers at any point in time.
- However, the way in which self-sufficiency is used drives up the deficit and contribution rates. The Panel believes that very few schemes use self-sufficiency as an input to the valuation of technical provisions in such a formulaic way.

EMPLOYER RELIANCE (STEP 2)

Employer reliance is deducted from self-sufficiency to calculate the technical provisions where technical provisions represent the prudent amount that the Scheme should have at any point in time to meet its liabilities. Put another way, reliance is the risk capital available to supplement the assets in order to meet its liabilities at any point in time. The value placed upon reliance drives many of the outcomes of the valuation, in particular the move to a low return, low volatility investment portfolio and the consequences for the future and current value of technical provisions.

The Trustee arrives at a view of the technical provisions liabilities in 20 years' time by deducting the value of the reliance it places on employers at that time from the value of self-sufficiency liabilities. To put a value on the reliance, the Trustees assess the employers' ability and willingness to support the Scheme with additional contributions and/or assets based upon their stated risk appetite and the covenant assessment of their capacity to support the Scheme.

The starting point for the USS Trustee in putting a value on the covenant is a covenant assessment undertaken by external consultants, PwC and EY Parthenon. A summary of these assessments has been shared with the Panel and some of the key slides are included in Annexes 5 and 6. Recent analysis by PwC and EY Parthenon suggest that the covenant, the employers' ability to support the Scheme, remains strong, albeit with some important short term challenges and considerable variation across the group of sponsoring employers.

The Trustee then, following consultation with employers, agreed a time limit for valuing the covenant (currently determined as 20 years) and a measure of the employers' risk capacity – their ability to pay contributions above their normal contribution rate. This is currently represented by additional contributions of 7% above the current employer contribution of 18% based on a payroll that is inflated by CPI +2%. The Trustee also measures the employers' risk appetite – their willingness to pay. The employers' risk appetite is assessed by the Trustee through a series of discussions and consultation with employers.

In the USS' September 2017 consultation, the reliance that the Scheme places on employers was estimated to be £22.6bn¹⁴ (£82.6bn of self-sufficiency liabilities less £60bn of assets). Following consultation with employers, who expressed some concerns about the level of risk in the Scheme¹⁵, the Trustees determined that the reliance in 2037 should be set at £10bn in today's money, a figure supported by employers¹⁶. The figure of £10bn is then used as the input for the reliance on the employer in Test 1. Given the strength of the sector and projected size of the scheme relative to the growth of the sector, the Panel believes a reliance of £10bn is too low. For example, using the salary growth assumption used elsewhere in the valuation (CPI+2%) rather than CPI to inflate the value of the reliance would ease the constraints on the reliance figure. This is a matter that would require further discussion between the Trustee and sponsoring employers.

The Panel's views of reliance are that:

- The Panel believes that the Scheme's advisers have put forward a clear, reasoned, well-evidenced and positive analysis of the sector which provides overwhelming support for the assessment the view that the covenant is strong.
- Furthermore, it is important to recognise that, as a result of previous changes to Scheme benefits, the Scheme is projected to grow at a slower rate than the sector as a whole¹⁷ and self-sufficiency liabilities are predicted by USS to fall by £1.4bn in real terms between 2017 and 2037¹⁸.
- There is no evidence to support the Regulator's weaker view of the sector and its categorisation of it as 'tending to strong'.
- While the covenant is strong, the Panel believe the employer and Trustee may be able to agree a larger risk envelope.
- When, in September, USS published its revised proposals in the light of the employer consultation we do not think that enough efforts were made to validate that these proposals truly reflected the employers risk appetite in the context of the increasing concerns being expressed by employee representatives.
- In particular, it is not clear whether employers would prefer a more stable but higher average contribution rate implied by a low volatility, low return strategy over a lower-on-average but possibly more variable contribution rate implied by a higher volatility, higher return strategy.

¹⁴ As reported by USS in presentation to JEP, July 2018

¹⁵ In particular, the reversion of gilt yields described above

¹⁶ Universities UK response to the USS Technical Provisions consultation. October 2017

¹⁷ USSADD6 included in Annex 7

¹⁸ USSADD37: Relationships between assets, technical provisions and self-sufficiency liabilities as requested by JEP

- Furthermore, it is not clear that employers fully understood the extent to which FSCs implied by Test 1 would consume a significant proportion of the target reliance.
- The Panel believes that employers' appetite for risk may have shifted since the consultation, a point evidenced qualitatively by a number of submissions to the Panel, some from Universities representing a significant share of the Scheme liabilities.
- While the Panel understands the difficulties in agreeing the value of reliance given the diverse financial positions of the employers, it suggests that a longer horizon would be appropriate given the unique nature and long-term prospects of the sector.
- The Panel agrees with some other commentators that there are other ways of calculating the value of reliance, for example by monitoring the difference between the self-sufficiency liabilities and the Scheme assets.
- The covenant assessment understandably does not monitor the **members'** appetite for risk and this does not feature as part of the reliance calculation because the legal responsibility to fund the Scheme rests with employers. However, in a scheme such as USS where members share the consequences of decisions made in the valuation, this absence seems to be a weak point and appears to be a factor in undermining confidence in the Scheme and its valuation. This issue should be addressed for future valuations and member engagement.
- The Panel notes that the USS view on the future path of gilts models the future path of gilts to remove market-driven volatility. Nonetheless, the model is calibrated to observed market outturns.

INVESTMENT PORTFOLIO FROM THE VALUATION DATE TO THE RELIANCE HORIZON (STEP 6)

Step 6 of Test 1 (as described above) is very significant to the outcome of the valuation. Having determined the value of technical provisions in 2017, Test 1 then assumes a linear investment trajectory that moves the Scheme assets from the Reference Portfolio¹⁹ at the valuation date to a low return, low volatility portfolio in year 20. This in turn, sets the discount rates applied to the technical provisions between the valuation date and the reliance horizon – that is year 0 and year 20.

- USS's approach to meeting Test 1 implies a de-risking of assets. A number of other paths are open to USS and could be explored.
- The Panel also believes that there are multiple paths that could be taken between the valuation date and year 20 that would result in very different outcomes for the valuation and contributions. One of these paths would be not to de-risk until year 20. In order for

¹⁹ The Scheme's hypothetical investment portfolio used to benchmark returns

employers to understand risk more fully, it would be helpful to illustrate, in consultation, the consequences of some of the different paths.

- Moreover, the Panel does not accept that moving to the portfolio outlined will in fact result in a de-risking of the Scheme but will simply introduce a different type of risk.
- USS has said that it does not take a 'gilts plus' approach. However, because the 2017 technical provisions are derived from the relative difference between self-sufficiency and employer reliance in 2037 they are substantially, albeit indirectly, driven by gilts. Since USS does not hedge interest rate risk due in part to its size and its view on gilt yield reversion, it is possible for assets and liabilities to diverge in value quite markedly in the short term. As a result, the valuation introduces gilts-induced volatility to the deficit and also to the future service rate. The very extreme profile of expected returns with a complex interaction due to the yield reversion assumption and a myriad other smaller risks are all being met within a £10bn risk envelope. As note above The Panel notes that the USS view on the future path of gilts models the future path of gilts to remove market-driven volatility. Nonetheless, the model is calibrated to observed market outturns.
- It is widely held that such an approach is inappropriate in current conditions because of exceptionally depressed returns on gilts. However, 'gilts plus' is used to estimate self-sufficiency liabilities, and via Test 1 this drives the valuation of today's TPs.

ASSUMPTIONS USED IN THE DRAFT 2017 VALUATION

In this section, the Panel's views on the assumptions employed in the 2017 valuation are summarised. The section divides into three:

- financial assumptions;
- non-financial assumptions (including demographics); and
- approach to prudence used in adjusting assumptions.

FINANCIAL ASSUMPTIONS

Determining the 2017 valuation requires a significant number of financial assumptions to be employed, including:

- the distribution of returns from a range of investments over the short and long term – this informs the discount rates used to value the liabilities;
- the prospects for inflation, both RPI and CPI, which shape the liabilities ; and
- expectations for salary growth in the sector.

Investment returns

The Trustee uses a "back to basics" bottom-up approach to assessing the returns that it expects from different assets over different time horizons (described as Fundamental Building Blocks – FBB – by the Trustee). The Trustee believes this to be consistent with the

approach used by other long-range forecasters. It is tested and validated against other data and models.

Central to the USS Trustee's current assumptions on investment returns is the expectation that gilt yields will, after 10 years, revert from the current historic lows to a level more consistent with history. Over the same period, growth assets such as shares are expected to underperform their historic average returns on the grounds that they are currently over-valued and have a poor short to medium-term economic outlook. Over the longer term, the Trustee assumes that all investment returns have reverted to their, higher, historic norms. The assumption about gilt yield reversion has been questioned by TPR in its discussions with the Trustee. Their views appear to have been based on the very different expectation of future returns used by other schemes. Many other schemes in the private sector, most of which are closed, use 'lower for longer' expectations of returns.

Before determining its approach to discount rates, the Trustee explored the distribution of possible returns, employing stochastic modelling using inputs from its FBB process. The median return that the model reveals for each asset class is then used as the best estimate return for that asset; i.e. the model gives a 50% chance that returns will be higher than the best estimate and a 50% chance that they will be lower. The combined portfolio return is used as the 'best estimate' discount rate for valuing the liabilities.

The prudent valuation discount rate used in 2017 is derived by using the 67th percentile of the model (the 65th percentile was used in 2014); i.e. the model gives a 67% chance that returns will be higher than the prudent rate and a 33% chance that they will be lower. The 67th percentile return is calculated using two disjointed time intervals. The 67th percentile cumulative return is calculated over the first 10 years, and the annual constant value equivalent to this is the average discount rate expected in the first 10 years. Then the 67th percentile cumulative return is calculated over the next 20 years. The annual constant value equivalent to this 20-year cumulative return is the average discount rate expected in the next 10 years. This averaged discount rate is reduced further to allow for de-risking after time 20. However, consultation with the employers led to some of the discount rates between the valuation date and year 20 being further reduced, to reflect the earlier implementation of a de-risking strategy²⁰.

A consequence of the low returns expected in the short term is that discount rates are set at a very low level for the first ten years. This in turn puts a higher current value on the short-term liabilities of the Scheme (than would a higher discount rate). The reversion of yields

²⁰ USS presentation to JEP June 2018

from year 10 results in higher discount rates being used for later years' liabilities. This has important consequences for the calculation of future service contribution rates which are consequently projected to decrease significantly over time.

The Panel's views of the investment return assumptions are that:

- The Panel supports the view that it is appropriate for a scheme of USS's size to develop its own model for establishing economic and investment outcomes as long as these are fully tested against other models. The Panel has not investigated all of the detailed assumptions on investment returns.
- The assumption of gilt yield reversion has become the focus of attention for some critics who believe that USS's assumptions are too optimistic. However, so long as USS holds a diversified (i.e. not 'de-risked') portfolio, the failure of gilt yields to revert will be accompanied by a change in the expected returns on other investments. The assumption of reversion is by no means as critical as some observers believe.
- USS assumptions about investment returns contain discontinuities and outcomes are very sensitive to those discontinuities. As we state elsewhere, we do not believe that de-risking is the only possible strategy for the Scheme, and the valuation would be more robust if it was based on the continuation of the current investment strategy.

Inflation and wage growth assumptions

Inflation and wage growth affect the USS Scheme valuation in a number of ways. Liabilities increase with inflation and wage growth. Thus inflation and wage growth affect the calculation of TPs and self-sufficiency as well as the value of the covenant through:

- The projected values of pensionable salaries, pensions in payment and deferred pensions.
- The impact of inflation on investment returns. It is generally accepted that, for example, the yield on nominal assets incorporates an additional return called the inflation risk premium. The inflation risk premium is the extra return required by investors to compensate them for the risk that inflation erodes the real return on that asset.

The Trustee uses the following assumptions in its valuation model:

- RPI is assumed to increase at a rate equivalent to the difference between the yield on a UK government fixed interest bond and the equivalent UK government index-linked bond, with a deduction of an inflation risk premium of 0.3% from the yield difference;
- CPI is assumed to be a constant 1% below RPI throughout the term of the valuation except in the calculation of self-sufficiency where it is assumed to be 0.8% below; and

- the Scheme's payroll in overall terms is assumed to grow annually at CPI+2%.

While the Panel could challenge on some of the assumptions used, it recognises that they are all largely subjective in nature, albeit calibrated with some guidance from the market.

The Panel believes that the Trustee could improve the way in which it explains the assumptions used.

NON- FINANCIAL ASSUMPTIONS USED IN THE 2017 VALUATION

Also affecting the valuation are a number of non-financial assumptions that centre around the demographics and behaviour of Scheme members, notably assumptions about:

- how long members and their partners and dependents will live and draw their pension (mortality assumptions);
- when members will retire or have to take ill-health retirement;
- what proportion of members are married or have partners who will draw a pension if the member dies before them; and
- what proportion of members will withdraw from the Scheme leaving deferred pensions or requesting a transfer.

The stated starting point for the Trustee on all of these assumptions is to look for a best estimate by first examining the experience of the Scheme to date and then adjusting estimates if there are scheme, external or other factors that mean that the experience to date may not be valid.

Mortality assumptions

The Trustee uses its scheme-specific experience of mortality to adjust CMI 2016 tables rolled forward over the valuation projection period. Members are generally shown to be longer-lived than the UK population. Long-term improvement rates (1.8% for males and 1.6% for females) are used which are higher than the CMI long-term rate of improvement of 1.5%, again based on the experience of the Scheme. Higher levels of mortality are assumed in 2017 than in 2014 but longer-term improvement rates are assumed to be higher.

The Trustee states that the changes between 2014 and 2017 imply a reduced liability of £0.7bn or 1.1% over the monitored 2014 basis (USS Nov 17 addendum).

Retirement ages

Members are assumed to retire at age 65 except for those with pre-2011 final salary benefits who are assumed to retire between 60 and 65 with peaks at 60 and 65. Members were assumed to retire at age 62 in the 2014 valuation. In practice, those on final salary benefits

have been shown to retire earlier or later than age 65. USS states that the change from age 62 has a limited impact on liabilities or contribution rate²¹.

A small proportion of members will retire on ill-health grounds. Rates are estimated from the Scheme's experience.

Marriage / dependents

The proportion of members with partners who are expected to draw a pension on the death of the member is based on the past experience of the membership. Analysis of data has led to the assumed rate at which males leave a dependent remaining as it was for the 2014 valuation. Females leaving a dependent has been reduced from 2014 in line with past 10 years' experience, retaining what is described as a small margin for prudence. USS states that this change to the valuation assumptions reduces the liabilities by 1% (compared to the 2014 basis).

Withdrawals from the Scheme

Withdrawal rates (active members becoming deferred members or transferring their benefits out of the Scheme) have been recalibrated by USS to reflect recent experience after the introduction of automatic enrolment. USS states that this has a limited impact on the liabilities: the shift from final salary to CARE means the Scheme is not greatly affected by such developments.

The Panel's views of the non-financial assumptions are that:

- It is appropriate, given its size, for the Trustee to adapt CMI mortality assumptions to its own experience. Data from other sources supports the view that the membership of USS is likely to live longer than the population average. However, views on whether they will continue to experience higher rates of improvement are more mixed²².
- It is not clear how mortality has been adjusted for prudence and what margin has been included for prudence on females leaving dependents. The Panel has not been able to form a view on whether the levels are appropriate.
- The use of 2016 mortality tables is understandable given the date of the valuation but 2017 tables have now been published that would indicate lower rates of longevity improvements which would, if incorporated, reduce the value of liabilities.

²¹ USS Methodology and Inputs for the 2017 Valuation: Initial Assessment. February 2017

²² [PLSA Longevity Model, 2017](#)

THE TRUSTEE APPROACH TO PRUDENCE

A concern raised by several stakeholders is that the Trustee is adopting an overly prudent approach to the valuation.

The Trustee has said it has limited its approach to prudence to reducing the discount rate and decreasing mortality assumptions. In all other cases, it uses best estimates (i.e. median outcomes which means that there is a 50:50 chance of being over- or under-performed).

The Panel's views prudence in the valuation is that:

- Taken overall, there appear to be several areas where prudence is adopted in addition to prudence in the discount rate and mortality assumptions.
- Setting reliance on the employer covenant at £10bn rather than £13bn is a form of prudence in its expression in Test 1.
- The use of CPI to inflate the value of reliance to its value in 20 years' time, rather than salary growth which is assumed to be CPI+2% per annum, also appears to the Panel to be a form of prudence.
- For an open scheme with a strong covenant and positive cashflow, the use of 20 years for the reliance horizon could also be argued to be too prudent.
- The use of the 67th percentile in 2017 is not consistent with the approach taken in 2014 and the rationale has not been fully explained by the Trustee.
- Inputs to the stochastic model themselves introduce a further, unquantified, level of prudence.
- The Panel advocates the use of the 2017 mortality tables for the 2017 valuation.
- The Panel believes that there may be levels of prudence incorporated into the valuation which, if addressed, would allow scope for more flexibility in other areas such as investment de-risking.

SETTING FUTURE CONTRIBUTIONS

In the following chapter we discuss the process employed by USS to consult on future contribution rates but immediately below we discuss the calculations involved.

The total future contributions required from employers and (under the cost-sharing agreement) from Scheme members, is made up of several components, namely:

- An assessment by the Trustee of the percentage of payroll required to fund the current deficit over the determined recovery period, called DRCs.

- An assessment by the Trustee of the percentage of payroll required to fund each year's worth of accruing benefits based on the valuation assumptions including discount rates and mortality.
- Assumptions about the cost of contributions to the Investment Builder (DC) section for those above the salary threshold and the match provided by employers to those who choose to make voluntary contributions to the DC section.
- Employer payment of the investment charges for members.
- The cost of some of the expenses of running the DB section of the Scheme.

At the time of writing this report, the Trustee had begun to consult with employees about increases to contribution rates from April 2019. The proposals are summarised in Figure 6:

Figure 6: Panel summary of USS consultation proposals²³ (% of salary per annum)

	Current	April 2019	October 2019	April 2020
Deficit recovery contributions	2.1% (paid by employer)	0%	0%	6% (paid by employer)
Future service contributions	13.3% employer 8% member ²⁴	17.8% employer 8.8% member	20.8% employer 10.4% member	17.2% employer 11.7% member
Employer contributions to USS Investment Builder	2.1%	1.2% ²⁵	1.2%	1.2%
Employer contribution to Scheme running costs	0.4%	0.4%	0.4%	0.4%
Employer subsidy of the cost of investment management	0.1%	0.1%	0.1%	0.1%
Total member contributions	8%	8.8%	10.4%	11.7%
Total employer contributions	18%	19.5%	22.5%	24.9%
Total contributions	26%*	28.3%**	32.9%**	36.6%**

* includes employer match

** excludes employer match

²³ USS. Notice of Statutory Consultation by Employers in relation to USS. September 2018

²⁴ Note: for those members earning over the salary threshold 8% of contributions on salary above the threshold are and, it is proposed, will continue to be invested in the USS Retirement Investment Builder (DC) section of the Scheme

²⁵ From April 2019, it is proposed that employers will no longer contribute a matched 1% contribution to the DC section of the Scheme for members who pay a voluntary 1% additional contribution but will continue to contribute 12% of salary above the threshold to the DC Scheme for those above the threshold.

The Panel's views of the USS approach to determining future contributions:

- USS has not yet fully justified to stakeholders or to the Panel its decision to increase the deficit recovery payments almost threefold. It has not yet consulted on the deficit recovery plan and yet is proceeding with a consultation on increases to contributions that assume this plan.
- The USS approach to the future cost of DB contributions results in contribution rates falling steadily in future years. Both First Actuarial and AON, the actuarial advisors to UCU and UUK, respectively, have indicated that the approach implies that the cost of future service contributions is expected to fall once the early years of low discount rates are taken out of the calculation and replaced by higher discount rates reflecting higher returns.
- The Panel understands that the Trustee wishes to ensure that future benefits are appropriately funded. The approach of requiring the exact contribution rate demanded by the valuation model in each year appears to introduce some unfairness between generations of members. Older members are unable to benefit from the anticipated future reductions in the contribution rate. An approach that smooths the increases over a number of years would seem to be fairer and reduce the volatility of future service contributions.

SUMMARY OF JEP ASSESSMENT

Having regard to its ToR and the requirement to take account of particular factors, the Panel has reached the following conclusions about the 2017 draft valuation:

Figure 7: Summary of the Panel's views on the 2017 draft valuation.

<p>Is the valuation outcome affordable to all parties while providing broadly comparable benefits?</p>	<p>The proposed Schedule of Contributions and the consequences of the cost-sharing invoked by Rule 76.4-8 will lead to levels of contribution that exceed the upper limit of affordability for some employers but should be affordable to the majority, according to PwC's analysis. However, in interviews, PwC found that most employers interviewed felt that they could only afford these levels for 1-2 years without pension contributions impinging on other priorities.</p> <p>Member contributions are proposed at a level considerably higher than current; an increase that would seem to imply that they are not easily affordable.</p> <p>At this level of contribution, it would appear difficult to maintain broadly comparable benefits over more than the very short</p>
---	---

	term.
Is the valuation outcome fair across generations?	<p>There are a number of inequalities highlighted by the valuation, in particular:</p> <ul style="list-style-type: none"> • De-risking exposes younger members to the risk of poor growth prospects, which in time could jeopardise the continued provision of DB and lead to a move to a purely DC scheme. However, the Panel recognises that the calculation is not simple and that older members could benefit disproportionately by a change in investment strategy. • A lack of smoothing of contributions places an additional cost on older members, as well as damaging the health (and thus salary and employment prospects) of the sector as a whole. • A clearer approach to prudence, perhaps adopting different assumptions for past and future service contributions might help to reduce inequalities and the differing impacts on employers and members.
Does the valuation balance stability and risk?	<p>The rigid application of Test 1 in circumstances where the valuation calculations are very susceptible to movements in gilt yields sets in train an iterative process. This involves contribution increases and investment de-risking which, arguably, leads to an end result which is not consistent with the unique features of the sector, the long-term nature and relative immaturity of the Scheme and the strength of the employer covenant. It appears to the Panel that the bigger picture has been lost in the complexity of the process.</p>
Does the valuation satisfy the current regulatory requirements?	<p>The valuation has clearly been conducted in a manner that thoroughly satisfies the regulatory requirements. However, as explained in the next chapter, the view of the Panel is that TPR itself has played a strong role in influencing the outcome.</p>

The assessment of the Panel has led it to conclude that: in order to complete the valuation, certain principles and consequent changes should be adopted. These are set out in Chapter 8.

7. VALUATION PROCESS AND GOVERNANCE

SUMMARY

- USS's unique governance arrangements place additional responsibility on the Trustee and the parties to manage the valuation process carefully to generate the support of stakeholders and their individual members.
- TPR has played a very large role in the valuation process. The Panel was surprised that TPR assessed the Scheme's sponsor covenant as only 'tending to strong', rather than accepting the 'strong' assessment of the Trustee's two covenant advisers. This does not appear to take account of the unique features of the Scheme or the HE sector.
- A number of consultation exercises and surveys have been conducted with employers. We recognise that this is not a simple task. In the Panel's view, the framing of questions may have steered particular outcomes, which have then supported overly prudent conclusions.
- Consultation periods have often been very short. This has not enabled large, complex institutions to take account of their own internal governance and consultation requirements, including consulting with staff members. Earlier engagement and longer consultation periods would be likely to result in fuller, more meaningful and more broadly supported outcomes.
- There is no formal Scheme-wide mechanism for involving Scheme members in the valuation process. This is of relevance in the context of the cost-sharing rules, which means that Scheme members share risk. This should be a matter for consideration in Phase 2 of the Panel's work.
- The Trustee has made a large amount of information available via its website. However, the view persists that the valuation was conducted "behind closed doors". Earlier engagement with all stakeholders would help to dispel this view and build confidence in future valuations. The complexity of some of the information has been a barrier to understanding and engagement.
- There is a view that the Trustee has not been open and transparent and has not shared information. As the Panel has acknowledged, the Trustee has been keen to share information with the JEP. However, the Trustee may wish to consider further how it might do this more broadly with Scheme members and sponsoring employers.

USS is a complex scheme, with multiple stakeholders who must be carefully considered throughout the valuation process. This creates a need to ensure the process is clear and well understood and that each party understands its role in the process so that expectations can be met. In turn this creates a need for clear – and clearly defined – processes and communications. The Panel considers that during the 2017 valuation this clarity has not always been achieved.

USS GOVERNANCE STRUCTURE AND ITS IMPACT ON THE VALUATION

One of the unique features of USS is its governance structure.

- The **Trustee** has the power given by the Scheme Rules to set contributions unilaterally. The Board of Directors of the Trustee company (USS Limited) currently comprises four employer-nominated directors (including the Board Chair); three union-nominated directors; and five independent directors.
- The **JNC** is a body established under the Rules and has a vital role in running USS. The JNC is responsible for considering how any changes in the contribution rate are to be applied. This may include changes to future benefits, future contributions or a balance of the two. The JNC is made up of equal number of UUK and UCU representatives, with an independent chair appointed by the JNC itself.

It is beyond the scope of this report to examine whether these arrangements should change, but the process needs to be managed better in terms of interaction with, and gaining the support and confidence of, employers and members.

THE ROLE OF THE PENSIONS REGULATOR

It is reasonable in a Scheme as large as USS that TPR should be kept informed during the valuation process. This is consistent with TPR's risk-based approach to regulation and their approach on early intervention.

TPR has been involved in the USS 2017 valuation process from a very early stage. This can be seen as having advantages and disadvantages:

- On the one hand, TPR's early involvement can be seen as providing guidance to the Trustee and stakeholders around the 'envelope' of outcomes acceptable to the Regulator.
- On the other hand, their early intervention can be seen as closing down options for discussion and negotiation and unduly influencing the outcome of consultations with employers.

The Regulator and Trustee have engaged in extensive correspondence throughout the valuation process. In September 2017, TPR wrote to the Trustee setting out its views on the strength of the employer covenant (as described in further detail below, TPR assessed the covenant strength as 'tending to strong' whilst the Trustee's covenant advisers assessed it

as 'strong') and said that the risks inherent in the Trustee's funding approach had not been fully articulated. These views were then shared with employers partway through the September consultation exercise by UUK. It would appear that the view of the Regulator influenced some employers to reassess their view of the amount of risk they were prepared to accept. A different sequencing of events could very well have resulted in a different set of employer views.

Whilst acknowledging the possible advantages of TPR's early involvement, it appears to the Panel that the Regulator's influence has been disproportionate. Some of those giving evidence to the Panel have suggested that the Regulator's views have steered employers' decisions.

TPR VIEW OF SPONSOR COVENANT

In the time available, the Panel has not been able to conduct its own review of the strength of the USS employer covenant. However, we have spent considerable time examining the covenant review work conducted for the Scheme by PwC and EY Parthenon (described more fully in Chapter 6 and Annexes 5 and 6). Both concluded that the covenant was "strong". The Panel can see no evidence to disagree with this assessment. Indeed we concur with the view that the covenant is "uniquely strong" within the universe of DB schemes overseen by TPR.

The Panel was therefore surprised that in its letter to the Trustee of 15 September 2017, TPR rated the covenant only as "tending to strong". TPR appears to have taken an approach to the valuation, especially in relation to employer covenant, that does not fully acknowledge the specificities of the Scheme or the sector, in particular: the very long-term nature of the Scheme; its relative immaturity and its cashflow positive nature. The Panel's views are that the Scheme's 'last man standing' arrangements are actually a source of additional strength in the context of the sector along with the unique features of the UK HE sector, including its longevity, excess demand for places, global strength, and the fact that stronger institutions bolster weaker institutions.

In the same letter, TPR also raises concerns about the growth of the Scheme relative to the sector. However, analysis prepared by USS and shared with the JEP suggests that looking at the size of the Scheme relative to the sector with or without the impact of gilt yield reversion, the size of the Scheme relative to the size of the sector is expected to fall, notably as the benefit changes introduced in 2016 take effect. (See Annex 7 for further information.) It is worth noting that other submissions to the Panel have undertaken a similar analysis looking at size on a cashflow basis and have also concluded that the scheme will shrink relative to the sector.

EMPLOYER CONSULTATION AND COMMUNICATION

A number of consultations and surveys have been conducted. These have ranged from technical discussion documents on the valuation inputs; to questionnaires on risk appetite; to a consultation on the 2017 valuation; and most recently the cost-sharing proposals under Rule 76.4-8 of the Scheme Rules.

The Panel acknowledges that it is hardly a simple task to consult with 350 different institutions or to ascertain their risk appetite. A consultation will inevitably generate a wide range of views and possible outcomes.

These results from the consultations on employer risk have been interpreted by the Trustee and distilled into a single number quantifying the reliance on the employer which feeds into Test 1.

The results have also supported a more conservative view of risk. The Panel notes that the Trustee has said that a contributing factor to the change in TPs and the valuation assumptions following the September consultation was the employers' view that they wanted to take less risk. Employers have said, however, that the Trustee's proposals were at the upper end of their risk tolerance.

The Panel has not taken a view on these differing perspectives.

The questions in several of the employer consultation exercises and questionnaires from USS and its advisers have been framed in a way that has not laid out for respondents the consequences or trade-offs between particular answers. For example:

- *The Trustee continues to run risk in the investment strategy in order to generate returns to reduce the cash payable from employers. If market conditions adversely change this could result in a need to increase the % of pensionable salary that employers are required to pay. In this scenario, what is the maximum % of pensionable salary that your HEI could afford to pay? (as a %)*
- *Based on your understanding of the Scheme, what level of contributions between 18% and 30% would you be willing to contemplate?*

The same questions framed in a different way, providing the context for the question and its answer, might have garnered quite different results.

It is debatable, therefore, whether employers have always been able to give fully informed answers to important questions, e.g. on covenant, ability and willingness to pay contributions and their capacity or appetite for risk, since they have not had the context within which to weigh their answers.

This point was well articulated in one of the employer submissions to the JEP which said:

"Considerable work was undertaken by all parties in the months leading up to the valuation and a wealth of information exists. However, much of this information was not pulled together in a coherent manner to enable members and employers to understand the likely valuation position, choices and consequences...more could be done in future to raise awareness at an earlier date and provide more accessible information to enable members and employers to express preferences on a better-informed basis."

These concerns are compounded by the fact that, whilst some institutions have large finance teams and in-house pensions expertise, this is not universally the case. Some institutions may have struggled with the complex nature of the questions being asked. In addition, the timeframes for consultations have sometimes been short. For example:

- The September 2017 consultation on the 2017 actuarial valuation was issued on 1 September with a deadline for responses of 29 September 2017 (which was later extended to 6 October to allow for dissemination and consideration of TPR's letter of 15 September 2017).
- Despite flagging its technical content, the consultation on methodology and inputs for the 2017 valuation was issued to employers on 17 February 2017 with a deadline for responses of 17 March 2017.

The JEP acknowledges that the short timescales for consultations have not always been at the Trustee's insistence or of their making. For example, the Trustee had originally scheduled the September 2017 consultation with employers for earlier in the summer. However, at the request of both stakeholders, the consultation was deferred to enable a period of negotiation that ultimately did not bear fruit. This in turn resulted in a compressed period for consultation which was shorter than the Trustee considered ideal.

Nevertheless, these short consultation periods do not take account of the complex internal consultation processes that large institutions (with their own internal governance arrangements) must follow.

MEMBER INVOLVEMENT IN THE VALUATION PROCESS

The terms of consultations with employers are narrowly constrained and, as noted above, responses are required within short time horizons. Given that many universities have governance structures that give a formal voice to academic members, longer consultation periods, initiated at an earlier stage, could facilitate member involvement via universities' internal processes, which might help to build confidence in the valuation and a shared sense of ownership – helping to avoid future, damaging, industrial disputes.

Notwithstanding arrangements at individual universities, there is no formal, scheme-wide mechanism for involving members in the valuation process or for assessing their appetite for changes to the Scheme. This is of relevance in the USS context given the cost-sharing arrangements where, unlike most pension schemes, there is an explicit recognition that employers do not bear all the risk or suffer the financial consequences where a deficit emerges.

These are issues that the Panel believes would require further deliberation upon in Phase 2 of its work.

INFORMATION AND TRANSPARENCY

USS have described the process for the 2017 valuation as being “the most transparent process ever”. However, despite the Trustee’s best intentions, there is a widespread view that the valuation process has been opaque. For example, a number of parties involved in the valuation – including those advising the stakeholders – have commented that there has been little interaction with, and visibility of, the Scheme Actuary. It is also difficult for stakeholders to assess the degree of challenge from the Trustee on USS inputs to the valuation.

For future valuation cycles it will be important that the Trustee and Scheme Actuary interact more, and at an earlier stage, with all stakeholders, particularly with regard to setting valuation assumptions and expectations. For example, it would be helpful if the modelling work undertaken to develop the valuation assumptions were open to advisers and others at an earlier stage. Whilst respecting the differing roles, formal and informal, laid out for the parties in the Scheme Rules and in statute, this would help to create more of a sense of shared ownership of the valuation and its outcome.

It is undoubtedly the case that there has been a large volume of information relating to the valuation placed on the USS website. This has included copies of the consultation exercises, Q&As, factsheets, blogs and video explanations.

The provision of this information has, in part, been in response to member requests and demonstrates the Trustee's desire to operate in an open and transparent way. However, much of the information that has been made available is extremely technical and complex in both language and content. Despite the high educational attainment levels of USS members, and engagement in their Scheme, it is very unlikely that all this material has been well-understood by a majority of Scheme members or sponsoring employers. As is the case in other areas of pension communication, volume is not a substitute for good quality information that is presented in a way that can be understood by all.

This lack of understanding is likely to have contributed to falling levels of member confidence in the Scheme²⁶. It might have been helpful for the Scheme to provide simple-to-understand guides which use clearly defined terminology to aid the understanding of the majority of Scheme members. This is something the Trustee may wish to consider for future valuation cycles.

It is encouraging that the Scheme has already acknowledged the need to "do better" in future. In his blog of 25 July 2018²⁷, USS Group CEO Bill Galvin says "...we clearly failed to communicate simply enough, convincingly enough, or from a basis of sufficient trust, to make the key messages clear." He goes on to say that the Scheme will review the process for the valuation with employers. The JEP suggests the Trustee also consider how it might improve the quality and content of its communication process with Scheme members to help rebuild confidence in USS and the valuation process.

BUILDING TRUST AND CONFIDENCE

The lack of trust in the valuation process and the Scheme has given rise to a view, albeit not a universal one, that USS is not being as open as it could be with stakeholders. The strength of feeling on this point has been made clear to the Panel in a number of submissions from employers and Scheme members:

- Some raised concerns that information would not be shared with the Panel and that USS would withhold information from the JEP. The JEP has been pleased to confirm in its regular stakeholder updates that USS has met the JEP's requests for information sharing and has answered questions.

²⁶ USS Annual Report and Accounts, 2018, p13

²⁷ www.uss.co.uk

- Others raised concerns that USS had not shared information with stakeholders, thereby preventing Scheme members from undertaking their own assessment of the valuation. These concerns have also been a recurring theme of the commentary on elements of the valuation process.

The Panel acknowledges that there is a careful balance to be struck in relation to the disclosure of confidential information. Some information will be highly commercially sensitive (for example covenant assessments that comment on the strength of individual institutions). Whilst observing the need for confidentiality (especially in relation to individual participating employers), the Panel suggests the Trustee may wish to consider how to share more of the information currently deemed confidential, e.g. on a redacted basis or in a summarised form. This would aid understanding of the valuation process (by employers and employees) and, importantly, help rebuild confidence in the Scheme and its governance.

8. CONCLUDING THE 2017 VALUATION

SUMMARY

The Panel has made a number of observations about the valuation assumptions and methodology which, if taken into account, would mean that the valuation could be revisited. In addition, there have been a number of post-valuation developments, which, if recognised, could influence the outcome of the valuation.

The Panel has developed five principles against which adjustments could be considered:

1. a fuller consideration of the employers' attitude ability and willingness to bear risk;
2. a greater consistency of approach between valuations;
3. intergenerational fairness and equality between Scheme members;
4. ensuring the valuation uses the most recently available information; and
5. the uniqueness of the Scheme and the HE sector.

The Panel believes that making adjustments in each of these areas would:

- have a material impact on the scale of the 2017 valuation and resulting contribution increases;
- create a space within which employer and members' can find common ground so that the issues around the valuation can be reconciled; and
- be consistent with the Trustee's fiduciary duties and the objectives of the Regulator.

These changes would enable the 2017 valuation to be concluded within a short timeframe while avoiding the need for the entirety of the contribution increases envisaged in the cost-sharing process. They will not address all of the issues facing the Scheme but it is hoped it would create the space for the stakeholders, through the JNC, to consider some of the longer-term issues facing the Scheme and provide a stable platform for a further review by the Panel.

The Panel does not underestimate the practicalities of concluding an actuarial valuation so long after the valuation date. Nonetheless the Panel believes it would be in the public interest if all the stakeholders, including TPR, could find way forward to implementing our recommendations within the 2017 valuation.

Having reviewed the 2017 valuation and heard evidence from a range of stakeholders, the Panel explored whether there are ways in which the 2017 valuation can be concluded while at the same time providing broadly comparable benefits to existing and new Scheme

members at a contribution rate and level of risk that is acceptable to employers and members.

In concluding this phase of work, the Panel is mindful of its ToR, namely, for Phase 1:

- To make an assessment of the 2017 valuation;
- To focus in particular on reviewing the basis of the Scheme valuation, assumptions and associated tests.

The Panel has also taken into account the requirement in its ToR to take into account the:

- unique features of the HE sector, intergenerational fairness and equality considerations;
- clear wish of staff to have a guaranteed pension comparable with current provision whilst meeting the affordability considerations for all parties; and
- current regulatory framework.

In defining broadly comparable benefits, the Panel has taken this to mean that, for the purposes of its Phase 1 work, core benefits should continue to be DB linked to salaries.

Affordability is a difficult concept to define. The Panel has taken this to mean keeping contribution levels as close to current levels as possible whilst striking an appropriate balance between risk and reward. The Panel is also mindful that very high contribution rates could prompt high levels of Scheme member opt-outs.

ADJUSTMENTS TO THE 2017 VALUATION

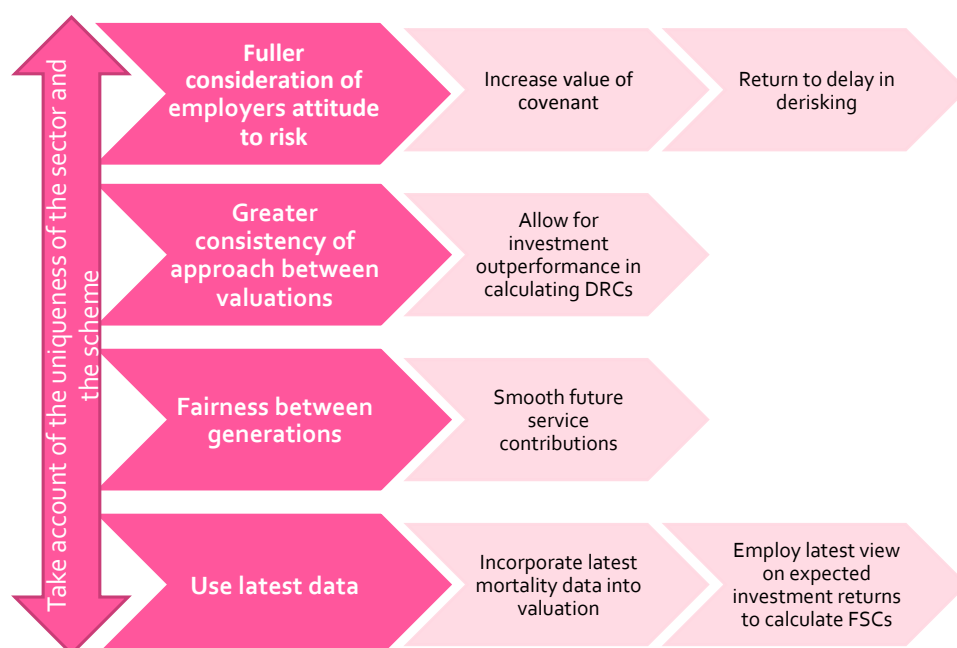
Based on its ToR; the conclusions reached in its assessment of the methodology and the assumptions used in the 2017 valuation; and with changes that have happened since the valuation was struck, the Panel has identified five principles where possible adjustments to the valuation should be examined:

1. The valuation should be completed using **a fuller consideration of the employers' ability and willingness to bear risk** which should be reflected in the assumptions used, in particular the measure of resilience and appetite for de-risking.
2. The valuation should seek to establish **greater consistency of approach** between valuations, particularly when major changes in future assumptions have an impact on expected costs from year to year.
3. The valuation should, where possible, result in **intergenerational fairness and equality** between Scheme members.

4. The valuation should **use the latest available evidence and information** when calculating contributions in considering the valuation and its impact on deficit and future service contributions.
5. **The uniqueness of the Scheme and HE sector** should be more fully taken into account in the valuation.

Taking these areas as our basis, the Panel has identified a number of adjustments to the 2017 valuation that it believes could be made:

Figure 8: Areas for possible adjustment to the 2017 valuation



In arriving at its views, the Panel has listened to arguments from all sides; both those who argue that the Trustee is being overly pessimistic and those who argue the opposite.

Against the background of the significant contribution increases proposed by the Trustee under Scheme Rule 76.4-8, the Panel has proposed only adjustments that could be implemented within a relatively short timeframe.

Our proposals are within the current valuation methodology. It is not part of our remit in this phase of the JEP's work to consider a new valuation methodology. Moreover any fundamental changes (e.g. to Test 1 which currently underpins the valuation) would require considerable work by USS and the Trustee board before a new approach could be adopted which would result in the delay to the implementation of the adjustments proposed by the Panel.

Making adjustments in each of these areas would have a material impact on the scale of the 2017 valuation and resulting contribution increases. The Panel also believes this would create a space within which employers and members can find common ground so that the issues around the valuation can be reconciled. It is also our view that the adjustments proposed are consistent with the Trustee's fiduciary duties and the objectives of the Regulator.

To support its work, the Panel has used analysis conducted by USS for the Trustee on the post-valuation experience and shared with the JEP. In addition, the Panel commissioned a joint analysis from AON and First Actuarial, the actuarial advisers to UUK and UCU, respectively. This report was provided by the two firms, without the input or involvement of UCU and UUK. AON and First Actuarial concur on the results presented in this report. It should be noted, however, that they did not have (and did not seek) access to the details of the Trustee's modelling. Their results should therefore be treated as being indicative of the possible impacts of the adjustments proposed. AON and First Actuarial's reports for the Panel are set out in Technical Annexes 10 and 11. The final impact would, rightly, need to be assessed by the Trustee in conjunction with their actuarial adviser.

RE-ASSESS RELIANCE ON THE COVENANT

It is the view of the Panel that the combination of Test 1 and the USS approach to establishing the risk capacity and appetite of employers has led to a widespread misunderstanding among stakeholders of:

- the risks to which the Scheme is exposed and the probability of those risks materialising;
- the consequences of employers stating that they do not want to increase their risk appetite and the way in which this would be interpreted by the Trustee;
- the implications of Test 1, in particular the extent to which the measure of self-sufficiency will drive investment decisions and returns, and limit the future performance of assets;
- the trade-off that exists between investment risk and contribution levels; and
- the consequences for industrial relations and future benefit negotiations.

We also note that in light of the debates on the valuation since the start of the year, a number of sponsoring employers have changed their views, now indicating that they would be willing to take more risk. Representations made to the JEP by sponsoring employers have also suggested there is both a willingness and appetite to take on more risk. The Panel has also found that employer decisions on attitude to risk were taken with imperfect knowledge and within a very short timeframe.

Taking these factors into account, it is the view of the Panel that the Trustee should reassess the employers' attitude to risk and take reassurance from the work of PwC and EY Parthenon about the longevity of the employer covenant beyond 20 years.

The covenant assessment, combined with USS's own analysis that shows that the size of the Scheme is expected to fall relative to the higher education sector, suggests to the Panel that a different approach could be taken to the value of reliance and/or the approach to de-risking the assets of the Scheme in the valuation.

The Panel also considers that the strength of the covenant would support a recovery period of 15-20 years.

The Panel asked AON and First Actuarial to examine the possible impacts on the deficit and cost of future benefits of reassessing the covenant. As an example, their work suggests the following possible outcomes:

AON and First Actuarial have suggested two possible changes:

Reverting to the September technical provisions, i.e. no de-risking for years 1-10, *could reduce the deficit by around £2.6bn and reduce the cost of current benefits by around 1.3%.*

Increasing the "target reliance" to £13bn (from £10bn in November 2017) *could have the effect of reducing the deficit by around £1.1bn and reduce the cost of current benefits by 1.0%.*

USS have also considered the range of potential reliance that may be provided by employers in the 2017 valuation:

Figure 9: Range of potential reliance that may be provided by employers in the 2017 valuation

Period over which additional 7% contributions are payable	15 years	20 years	25 years
Present value (PV) at time zero of 7% of payroll	£10bn	£13bn	£18bn
<i>Future value at time 20 of above PV in real terms rolled forward with CPI</i>	<i>£10bn</i>	<i>£13bn</i>	<i>£18bn</i>
Future value at time 20 rolled forward with RPI	£12bn	£15bn	£21bn
Future value at time 20 of above PV in real terms rolled forward by salary growth	£14bn	£19bn	£26bn

The Panel concludes that:

Until there can be a more fundamental re-evaluation of the valuation methodology, the Panel believes it is sensible to assume (as in the September 2017 Technical Provisions consultation) that there is no de-risking for the first 10 years and that reliance can be set at a higher figure.

USS should give serious consideration to adopting these proposals in finalising the 2017 valuation and that this should be done in conjunction with the other proposals outlined below.

ADOPT A CONSISTENT APPROACH

There are a number of areas where the Trustee has not adopted a consistent approach between the 2014 and 2017 valuations, one of the most significant being the decision not to allow for any out-performance of assets in the calculation of DRCs in 2017.

While the calculation of the technical provisions must be undertaken on a prudent basis, it is possible for deficit recovery contributions to be calculated using a discount rate that sits somewhere between the best estimate and the valuation's prudent discount rate. In 2014, the Trustee proposed a deficit contribution rate that allowed for 50% of the assumed out-performance of the assets over and above the discount rate.

The Panel asked AON and First Actuarial to assess the likely impact on DRCs of adopting an approach consistent with that used in 2014. Their results suggest the following possible outcomes:

First Actuarial and AON have suggested that the 2017 proposal for 6% deficit recovery contributions does not appear to make any allowance for out-performance of assets over and above the discount rate. Their calculations, based on a £7.5bn deficit, suggest that – adopting a 17 year recovery period – factoring in a 50% out-performance should allow the Trustee to reduce the DRCs to 1.7% for 15 years starting in 2019 (having continued to pay 2.1% for two years).

Allowing for a lower level of 25% out-performance would bring the deficit contributions down to 3.8% for 15 years. The table below shows how different assumptions on recovery period, asset out-performance and deficit level could lead to different DRCs.

Recovery period from valuation date	Period over which deficit contributions above 2.1% are payable	Current benefits: £7.5bn deficit				Illustrative £4bn deficit (added by Aon)			
		Asset outperformance:				Asset outperformance:			
		0%	10%	25%	50% (added by Aon)	0%	10%	25%	50%
12 years	10 years	8.8%	7.8%	6.3%		4.7%	3.7%	2.2%	
13 years	11 years	7.9%	7.0%	5.6%		4.2%	3.3%	1.9%	
14 years	12 years	7.2%	6.3%	5.0%	2.8%	3.8%	2.9%	1.6%	Nil
15 years	13 years	6.6%	5.8%	4.6%		3.5%	2.7%	1.5%	
16 years	14 years	6.1%	5.3%	4.2%		3.3%	2.5%	1.4%	
17 years	15 years	5.7%	5.0%	3.8%	1.7%	3.0%	2.3%	1.1%	Nil
18 years	16 years	5.3%	4.6%	3.5%		2.8%	2.1%	1.0%	
19 years	17 years	5.0%	4.3%	3.3%		2.7%	2.0%	1.0%	
20 years	18 years	4.7%	4.0%	3.0%		2.5%	1.8%	0.8%	

The Panel concludes that:

The Trustee should adopt a consistent approach to the calculations of DRCs between the 2014 and 2017 valuations which would make an allowance for outperformance of investment returns.

We note that in their evidence to us and in the pre-September 2017 consultation on deficit recovery contributions, the Trustee had proposed that a lower level of DRC should be linked to the availability of trigger contributions (i.e. contributions that would be available to the Trustee if DRCs proved to be inadequate). However, we conclude that that is an issue to be addressed for the longer term, and as part of a wider review.

For the shorter term, we see no reason not to include an allowance for asset out-performance, not least as it will be two-thirds of the way through the valuation period at the point that these DRCs come into effect and, as noted below, there has been some asset out-performance in 2018.

SMOOTH FUTURE SERVICE CONTRIBUTIONS

We note that the USS model is time-dependent because it assumes low returns for the first 10 years and then 'normal' returns for the subsequent 10 years. This creates unusual effects in the valuation results, in particular FSCs.

The effect is heightened by the approach taken by the Trustee in calculating future service contributions. In arriving at its calculation of the cost of future defined benefits, the Trustee has used the figure for future service contributions for the year following the valuation only. The effect is that FSCs rise in the first year but are then expected to fall for several years after the 2017 valuation. Not all schemes adopt this approach, choosing instead to adopt a

standard actuarial approach which smooths increases over a number of years of expected costs.

The approach used to determine discount rates in Test 1, and in particular the view taken on gilt yields and yield reversion, results in the first year of new contributions being very high due to very low expected returns in year one. With cost-sharing in place, younger members can be expected to benefit fully from this eventual reversion to lower contribution levels whereas those closer to retirement will pay only the higher contribution levels.

AON and First Actuarial have indicated that they anticipate that future service contributions could be expected to fall during the next six years and further beyond that. The six-year average FSC rate is 1.5% below the cost-sharing consultation's April 2020 FSC rate. AON and First Actuarial have stated that it would be reasonable for the Trustee to take account of this fall in the cost of future service benefits in the Schedule of Contributions which accompanies the valuation. Currently, no such allowance is made by the Trustee.

The Panel recommend determining the cost of FSCs by using an average rate over a period no shorter than two valuation cycles. This approach would keep the FSC rate constant for the period, rather than it rising and then falling and would be intergenerationally fairer.

The Panel believes that this reduction could be even greater if there were to be no de-risking of the Scheme in the longer term.

USE LATEST AVAILABLE INFORMATION AND DATA

Since the date of the 2017 valuation (31 March 2017), much has changed that could affect the Trustee's assessment of the deficit and future service contributions.

The 2017 valuation has been based, to date, on 2016 mortality data. However, this could be updated to be based on CMI 2017 mortality tables which have become available since the valuation process commenced. The Panel believe that this would have the effect of reducing the deficit and contributions still further. We note that such an approach would be consistent with the Trustee's approach in the 2014 valuation. For the 2014 valuation, new mortality tables were released towards the end of the valuation process which were then incorporated into the final valuation assumptions. We also note that the Regulator has said it is acceptable to adjust valuation assumptions in the light of new data such as this.

We have examined the impact of using the new 2017 mortality tables based on analysis provided directly by USS and a further assessment from AON and First Actuarial. Both

parties reach similar conclusions regarding the positive impact of incorporating the most recent 2017 mortality data on the valuation of accrued liabilities.

USS's analysis suggests that using CMI 2017 data could "reduce the accrued liabilities by approximately 0.5% or £0.3bn". (See Annex 9 for further information.) This view is supported by AON and First Actuarial who conclude that the use of CMI 2017 mortality data would reduce the deficit by £0.2bn-£0.3bn and reduce contributions by around 0.12% for current benefits.

The Panel recommends the use of latest available mortality data in concluding the valuation.

Based on the size of assets shown in the 2018 USS Report and Accounts²⁸, the Panel notes that the assets of the Scheme have grown at a rate that is higher than the discount rate used for year one of the 2017 valuation. Such a change could be taken into account in the deficit recovery plan and the calculation of future service contributions and would support the view expressed above that out-performance should be shared in the calculation of deficit recovery contributions.

Any change in expected future investment returns (upwards) could also deliver a reduction in the deficit and could also be reflected in future contributions.

USS estimates put the 2018 deficit at £4bn (compared to £7.5bn in the 2017 valuation), with £2.1bn of the reduction being attributed to asset out-performance in the year (see Technical Annex 9).

USS estimates attribute £1.5bn of the reduction in deficit in 2018 to a change in their expectations of future investment returns.

USS anticipate that these changes could reduce future service contributions by 0.9% per annum.

The Panel would encourage the Trustee to consider taking account of expected future investment returns in calculating contribution rates.

²⁸ USS Report and Accounts 2018

IMPACT ASSESSMENT

The Panel believes that applying the adjustments set out above could have a significant impact on both the deficit and FSCs. The Panel has been cautious about declaring any impact when it has not had access to all data required to undertake a full valuation of its own. However, it has also been aware that, without any estimate of the effect, the principles may be insufficient to reach a consensus between stakeholders.

The charts below, based on analysis by AON and First Actuarial, represent the Panel's estimates of the possible impact before allowing for any possible interaction between the changes which might reduce or increase the effect. The numbers should be treated as indicative only since any final outcome will require more detailed modelling. Furthermore, any decisions on whether and how they should be taken into account lies, rightly, in the hands of the Trustee.

Figure 10 shows the possible impact of applying the first three areas of adjustment above, namely:

- Reverting to the September 2017 basis for calculating TPs, i.e. delaying de-risking for 10 years and increasing reliance on the employer covenant to £13bn which AON and First Actuarial indicate that, taken together, these could reduce contributions by 1.9%.
- Allowing for out-performance to bring the deficit recovery payments back down to 2.1%.
- Smoothing the increase in contributions over 6 years.
- Moving to the CMI 2017 mortality data.

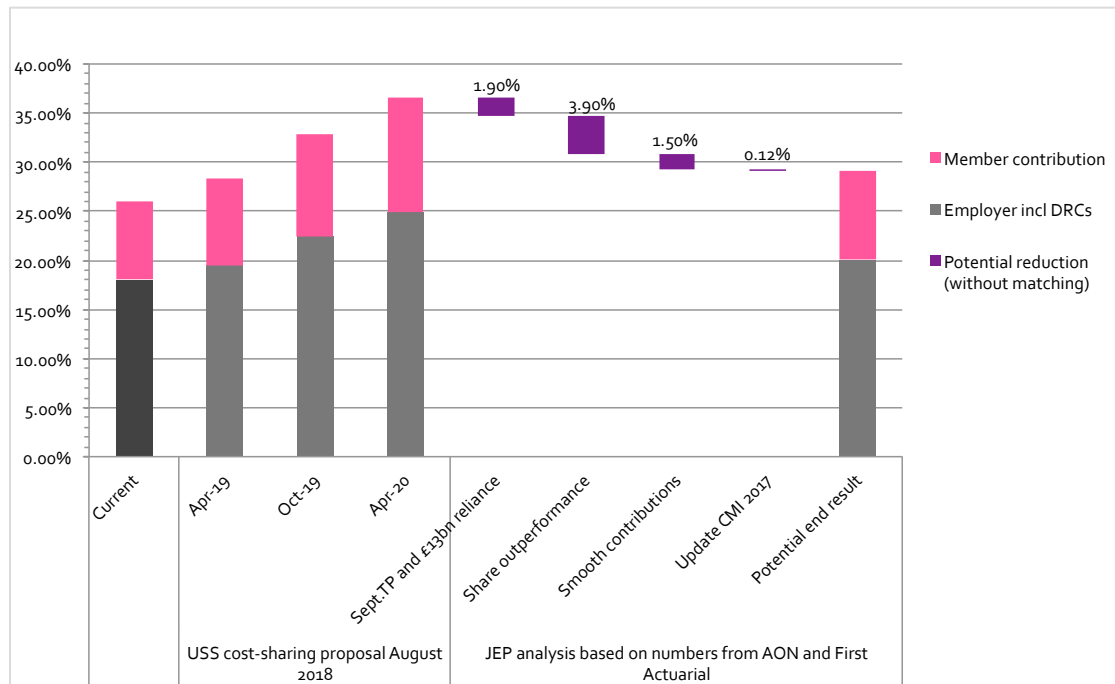
The chart does not incorporate other post valuation changes such as asset outperformance or changes to future investment returns but believes that these add support to the proposed changes. Incorporating changes to future investment returns into the calculation of future service contributions could bring contributions down further.

Contributions are estimated to fall from the USS proposed 36.6% level in 2020 to 29.18% with the same defined benefits (but, in order to present a position consistent with the cost-sharing proposal, figures are presented with no employer match of 1% for DC contributions). If the employer match were added back in, the contribution rate would be 30.08%.

Based on the Panel's understanding of cost sharing, the contributions without matching could result in member contributions of 9.11% and employer contributions of 20.071%. It

will ultimately be for the JNC to determine how any new contribution rate is split between employers and Scheme members.

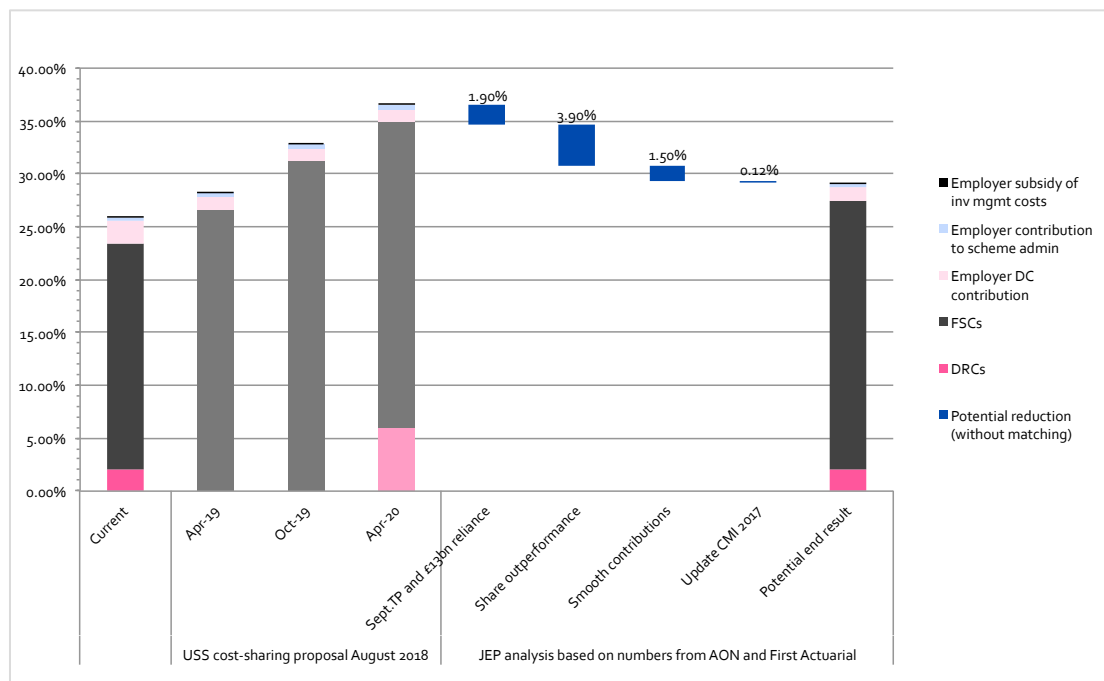
Figure 10: Potential impact of adjustments on member and employer contributions (no employer match for DC)



agement added for completeness.

Figure 11 shows the same data but this time split between deficit recovery and future service contributions, with the employer's contributions to the Investment Builder (DC) section, administration and investment management added for completeness.

Figure 11: Potential impact of adjustments on deficit and future service contributions (no employer match for DC)



The Panel believes that there are a number of different paths that the Trustee could adopt to reduce the contribution rate to below 30%; the charts above simply demonstrate one approach. Another approach might involve taking account of changes to future investment expectations or taking account of asset out-performance in 2018 more explicitly.

The changes suggested by the Panel are based on the current benefit arrangements. No new DB changes have been proposed and it was not within the JEP's ToR to suggest such changes – this is the remit of the JNC. It should also be noted that in the time available, the JEP has not had the opportunity to test the acceptability of these proposed changes with employers and members.

The proposed changes set out are also intended to be a pragmatic way forward to provide a swift resolution to the issues facing the Scheme.

ACHIEVING THE CHANGES

The Panel is alert to the difficulties in achieving the changes set out above, particularly in the light of the exchange of views between the Trustee, employers and the Regulator on appetite for risk and strength of the covenant.

However, the Panel is confident that a way forward can be found that satisfies the risk appetite of the Trustee and that would create a space within which the employers'

tolerance for contribution changes and the members' tolerance for benefit changes could be reconciled. Implementing change will require a commitment from all parties to work together at speed to agree a process that would enable any changes resulting from these proposals, to forestall the high contribution increases proposed for 2019. These proposals should also create a more stable environment for UUK and UCU to give further consideration to the long-term future of the Scheme.

If these principles and the changes that flow from them are accepted and adopted, the Panel is confident that the 2017 valuation can be completed in a way that satisfies all stakeholders and that:

- reflects the unique nature of the HE sector;
- provides for intergenerational fairness and equality;
- delivers broadly comparable benefits;
- meets the affordability challenges facing all parties; and
- satisfies the current regulatory framework.

9. LOOKING AHEAD

In the time available to it, the JEP has undertaken a thorough examination of the methodology, tests and assumptions used and has provided commentary on their application and the overall approach to the valuation adopted by the Trustee. We have also made recommendations as to revisions to the 2017 approach that would enable the 2017 valuation to be concluded, and bring some short-term stability to the Scheme whilst creating space for the Trustee and JNC to consider what, if any, longer-term changes to the Scheme are necessary.

However, it is clear that there are a number of issues that remain to be resolved. While the JEP has commented on the many elements of the valuation, we have not opined on whether there is a different way of reaching a conclusion that could provide long-term stability to the valuation process and have the support and confidence of all parties. The Panel believes this should be a core element of its second phase of work. In view of the need to prepare for the 2020 actuarial valuation, the Panel believes that Phase 2 should start as soon as possible. However, this work requires a firm foundation and cannot be concluded until the 2017 valuation has itself been concluded.

Phase 2 should also include a wider review of the approach and involvement of UUK and UCU to future valuations so that a more collaborative approach can be adopted and industrial action, such as that witnessed earlier this year, can be avoided. That would require examining the interaction of the various bodies with a formal role in the valuation process; considering the potential for the involvement of Scheme members in agreeing the valuation process; and considering how more effective engagement with employers can be achieved.

ANNEXES

GLOSSARY OF TERMS

Covenant	The covenant is the extent to which the funding of the Scheme relies on the legal obligation and financial ability of the employers in the event of the Scheme being under-funded.
De-risking	De-risking in a pension scheme context means removing risks from the scheme. This will come at a cost and may result in replacing one type of risk by another kind of risk. For example, moving to a low volatility, low return investment strategy may reduce the volatility of investment returns and hence the volatility of contributions. However, such a strategy is expected to result in higher contributions due to lower expected investment returns.
Fundamental building blocks (FBB)	A framework for breaking down historical investment returns into their components. Expectations of how the components will change in the future can then be used to model future investment returns. ²⁹
Gilts plus	In a gilts plus valuation, the projected investment return on each asset is calculated as the yield on government bonds plus a fixed amount – called a risk premium. The size of the risk premium depends on the asset. This means that discount rates are determined by reference to government bond yields, since discount rates are set equal to investment returns less a margin for prudence.
JNC	Joint Negotiating Committee.
Last man standing	In the USS, if a sponsoring employer goes bankrupt then the remaining, solvent sponsoring employers are liable for the bankrupt employer's share of the Scheme's liability. In a doomsday scenario, the last solvent sponsoring employer is liable for the Scheme's liability.
Match	All active members of USS can choose to contribute an additional 1% of their salary to the USS Investment Builder. Their employer will match this contribution, and no more, by also contributing 1% of that member's salary.
Prudence	Prudence tries to make sure that liabilities are not under-stated. It represents adjustments to the best estimate assumptions, in order to increase the chance of the assets being sufficient to pay all the benefits without the need for additional contributions. An

²⁹ <https://www.uss.co.uk/~media/document-libraries/uss/how-uss-is-run/valuation/fbb-expected-returns-description-march-2018-final.pdf>

	<p>assumption of future outcome is a best estimate if there is a fifty-fifty chance of the actual outcome being better or worse than the assumption.</p>
Reliance on covenant	<p>In USS' terminology reliance is the difference between the value of assets required to attain self-sufficiency and the actual asset value held by the Scheme.</p> <p>The Reliance capacity indicates how much employers are willing to contribute above 18% of payroll over a fixed number of years. The reliance capacity can be used to see if the reliance is within the willingness of employers to contribute above the regular contribution rate. The reliance capacity may be much less than the covenant, as the reliance emphasises the willingness of employers to contribute rather than their ability to contribute. In this report we use reliance as a general term for both reliance and reliance capacity.</p>
Salary threshold	<p>The annual pension accrued in a year by a member in the Retirement Income Builder is based on their annual salary, but with their salary capped at the salary threshold. The salary threshold for 2018/19 is £57,216.50. It is revalued each 1 April to take account of price inflation.</p>
Self-sufficiency	<p>For the 2017 valuation, the self-sufficiency liability value is the amount of money which is enough to pay for the liabilities in 95% of modelled future scenarios assuming that a specified investment strategy is followed. The self-sufficiency basis is the set of financial and demographic assumptions used to value the self-sufficiency liability.</p>
Technical Provisions	<p>The technical provisions value is the amount of money which is anticipated to pay for the liabilities assuming that a specified investment strategy is followed. The technical provisions basis is the set of financial and demographic assumptions used to value the technical provisions liability.</p>
TPR	<p>The Pensions Regulator.</p>
Trustee	<p>A company called USS Limited (USSL) acts as the trustee for USS. The trustee of a pension scheme holds assets in the trust for the beneficiaries of the Scheme and acts separately from the employers. Trustees are responsible for ensuring that the pension scheme is run properly and that members' benefits are secure.</p> <p>The Board of Trustees are the Directors of USSL. They are a group of 10-12 people of whom between 3-5 are independent members, 3 are</p>

	<p>nominated by UCU and 4 are nominated by UUK. Currently there are 12 directors.</p> <p>Day-to-day management of the Scheme is delegated to the USS Executive, who are employees of USSL. The Board of Trustees take decisions on the management of the Scheme, advised by the USS Executive and professional advisers.</p>
UCU	University and College Union, the member representative body under the USS Scheme Rules and other governing documents.
USS Investment Builder	The Investment Builder is the defined contribution section of the Scheme. Members who earn above the salary threshold are automatically enrolled in the Investment Builder section. Other members may choose to join.
USS Retirement Income Builder	The Retirement Income Builder is the defined benefits section of the Scheme.
UUK	Universities UK. Representative body for Universities in the UK under the USS Scheme Rules and other governing documents. UUK has 136 members. However, for the purposes of USS, UUK represents all 350 institutions in the UK participating in the Scheme.

ANNEX 1: JEP MEMBERSHIP

The JEP has six members, three nominated by UCU and three by UUK and an independent chair.

JOANNE SEGARS OBE (INDEPENDENT CHAIR)

Joanne is currently the Chair of LGPS Central Ltd, which pools the assets of 9 Midlands-based local authority pension funds. She serves on the Board of the Environment Agency and chairs its pension fund. Joanne sits on the Board of NOW: Pension and is a Director of the Pensions Policy Institute. She was previously the Chief Executive of the Pensions and Lifetime Savings Association (formerly the NAPF). Joanne held the pensions brief at the Trades Union Congress for 13 years. She was a Board member of PensionsEurope from 2010-2017 and its Chair from 2012-2015.

RONNIE BOWIE (APPOINTED BY UUK)

Ronnie is an experienced actuary, currently Partner (previously Senior Partner) at Hymans Robertson having joined the firm in 1980. Since August 2016 Ronnie has undertaken the role of Chair of Court at the University of Dundee. Ronnie was President of the Faculty of Actuaries and was a driving force behind its merger with the Institute of Actuaries becoming the first President of the combined Institute and Faculty of Actuaries. He is Chair of the Royal Bank of Scotland Pension Scheme, Chair of the With Profits Committee of the Prudential Assurance Corporation, Chair of Byhiras Trust and a fellow of the Royal Society of Edinburgh.

SALLY BRIDGELAND (APPOINTED BY UUK)

Sally is an actuary with pensions and investment experience both as an adviser and a trustee. She currently combines governance consultancy for Avida International with a number of non-executive and advisory roles. She is a trustee at NEST Corporation, the Lloyds Bank pension schemes and at the Nuclear Liabilities Fund. Sally was previously the Chief Executive Officer of BP Pension Trustees Limited. Before BP, Sally spent twenty years working both as a pensions actuary and in investment research and innovation. Sally was the first lady Master of the Worshipful Company of Actuaries in 2016-17 and currently serves on the Royal Society's Advisory Committee on Mathematics Education (ACME).

CHRIS CURRY (APPOINTED BY UUK)

Chris is the Director of the Pensions Policy Institute (PPI) with overall responsibility for leading and managing the PPI. At the PPI Chris has authored and presented a number of research reports analysing and other provision for retirement income. In 2017, Chris was one of the three co-chairs for the DWP Automatic Enrolment Review Advisory Group. The review looked at ensuring workplace pensions continue to meet the needs of individual

savers, and employers, whilst remaining fair, affordable and sustainable for future generations. Chris started his career as an Economic Adviser at the Department of Social Security (now the Department for Work and Pensions) before joining the ABI as Senior Economist.

CATHERINE DONNELLY (APPOINTED BY UCU)

Catherine is an associate professor at Heriot-Watt University, where she heads up the Risk Insight Lab focussing on pensions, investment and insurance research. Her own research examines different approaches to pensions and retirement income including defined benefit and collective defined contribution models. Before entering academia, she worked for several pension consultancy firms in the areas of pension scheme valuations and asset-liability modelling. She is a qualified actuary and has a PhD in financial mathematics from University of Waterloo in Canada.

SAUL JACKA (APPOINTED BY UCU)

Saul is a professor of statistics at the University of Warwick and a Turing fellow at the Alan Turing Institute. He has worked in mathematical finance for over 30 years, and much of his research has focussed on how this field links with actuarial science. He is also a trustee of a defined benefit pension scheme for non-USS staff at the University of Warwick, and an independent actuarial examiner for the Institute and Faculty of Actuaries (IFoA).

DEBORAH MABBETT (APPOINTED BY UCU)

Deborah has a strong academic background in pension policy. A professor of public policy at Birkbeck, much of her research has focussed on the relationship between the state and occupational or private pension schemes. Her current research focuses on the implications of rising and flexible retirement ages for the management of pension assets. She holds a PhD in Economics from the University of Oxford and has previously worked as an adviser to the World Bank in Lithuania and Moldova. She is also currently co-editor of the Political Quarterly.

ANNEX 2: JEP TERMS OF REFERENCE

1. Background

UCU and UUK have agreed to form a Joint Expert Panel.

2. Scope

The agreement reached on 23 March 2018 under the auspices of Acas was formally adopted by UCU and UUK and forms the foundation of the panel's process.

The agreement set out that the purpose of the panel is to:

- make an assessment of the 2017 valuation (paragraph 5 of the Acas agreement)
- focus in particular on reviewing the basis of the scheme valuation, assumptions and associated tests (paragraph 4 of the Acas agreement)
- agree key principles to underpin the future joint approach of UUK and UCU to the valuation of the USS fund (paragraph 1 of the Acas agreement)

The agreement set out that the panel would take into account:

- the unique nature of the HE sector, intergenerational fairness and equality considerations (paragraph 4 of the Acas agreement)
- the clear wish of staff to have a guaranteed pension comparable with current provision whilst meeting the affordability challenges for all parties (paragraph 4 of the Acas agreement)
- the current regulatory framework (paragraph 4 of the Acas agreement)

The agreement set out that parallel discussions will continue between UUK and UCU on:

- comparability between TPS and USS (paragraph 6 of the Acas agreement)
- alternative scheme design options (paragraph 6 of the Acas agreement)
- the role of government in relation to USS (paragraph 6 of the Acas agreement)
- the reform of negotiating processes to allow for more constructive dialogue as early as possible in the valuation process (paragraph 6 of the Acas agreement)

This document (Terms of Reference) underpins and supplements the 23 March agreement but does not override it.

3. Reporting

The panel will aim to submit a report to UUK and UCU in September 2018 that meets the purpose described above in relation to the 2017 valuation.

The panel will provide a follow up report that meets the purpose described above in relation to the USS valuation process in general. The follow up report will relate to valuations after the 2017 valuation.

4. Chair

The scheme stakeholders UCU and UUK will jointly agree the independent Chair.

The Chair will be involved in determining the order of work within the reporting timescales above.

The role of the Chair will be to provide leadership for the panel, to ensure that it functions effectively, that its members are able to participate fully and that its purpose is met.

5. Membership

The scheme stakeholders UCU and UUK will each select 3 panel members.

In nominating the panel members, UCU and UUK shall have regard to the responsibilities required of these individuals and will appoint those who possess the relevant skills and capabilities.

6. Remuneration/expenses

Any costs incurred relating to the Chair and secretariat and will be covered 50/50 between UUK and UCU. Any additional costs will be incurred by the relevant side for their nominated members.

7. Secretariat

The panel shall be supported by a joint secretariat appointed by UCU and UUK in agreement with the Chair.

8. Meeting arrangements

Meeting frequency: Meetings will take place at regular intervals and will be timed to facilitate the production of reports to the JNC.

Meeting location: To be determined by the Chair

Quorum requirements: All panel members should endeavour to be present for all meetings. If it is not possible for panel members to join the meeting in person, they may join via telephone conference or videoconference. The quorum for the meeting will be 4 panel members, with a requirement that there are at least 2 panel members appointed by UUK and two by UCU present at each meeting.

Meeting actions: Panel will produce action points to be agreed by the Chair. These action points will be available within 7 working days of each meeting.

9. Advice, evidence and information

The panel will have access to a collection of expert witnesses, including (but not limited to) the actuarial advisers of UUK and UCU, the USS Trustee, the Scheme Actuary and the Pensions Regulator.

The panel may also refer to evidence submitted by interested parties.

The panel will be provided with a pack of evidence and reports to date relating to the USS (subject to agreement of USS Trustee).

10. Confidentiality

The contents of all panel meetings are confidential to the panel members, except the agreed action points which will be provided to UUK and UCU.

All material provided to the panel is confidential to the panel, whether from the evidence pack, expert witnesses or submitted evidence.

11. Conflict of Interest

All members of the panel will be asked to declare any current or potential conflicts of interest related to the subject matter of the panel deliberations.

A conflict of interest log will be maintained as the responsibility of the Chair, and this will detail any action taken to mitigate potential conflicts. The log will be monitored by UUK, UCU and the panel's secretariat.

12. Reaching conclusion

The panel is expected to reach a consensus on the content of its reports.

If a vote is required, the Chair shall not participate.

ANNEX 3: ACAS AGREEMENT 23 MARCH 2018

1. A formally agreed Joint Expert Panel, comprised of actuarial and academic experts nominated in equal numbers from both sides will be commissioned, to deliver a report. Its task will be to agree key principles to underpin the future joint approach of UUK and UCU to the valuation of the USS fund.
2. It will require maintenance of the status quo in respect of both contributions into USS and current pension benefits, until at least April 2019.
3. There will be a jointly agreed chair whose first step will be to oversee the agreement of the terms of reference, the order of work and timescales with the parties. Any recommendations by the group must be based on a majority view of the panel without the use of a casting vote. A secretariat, jointly agreed by the parties, will be appointed.
4. The panel will focus in particular on reviewing the basis of the scheme valuation, assumptions and associated tests. It will take into account the unique nature of the HE sector, inter-generational fairness and equality considerations, the need to strike a fair balance between ensuring stability and risk. Recognising that staff highly value Defined Benefit provision, the work of the group will reflect the clear wish of staff to have a guaranteed pension comparable with current provision whilst meeting the affordability challenges for all parties, within the current regulatory framework.
5. The panel will make an assessment of the valuation. If in the light of that contributions or benefits need to be adjusted in either direction, both parties are committed to agree to recommend to the JNC and the trustee, measures aimed at stabilising the fund to provide a guaranteed pension broadly comparable with current arrangements.
6. Alongside the work of the panel both sides agree to continue discussion on the following areas: comparability between TPS and USS; alternative scheme design options; the role of government in relation to USS; and the reform of negotiating processes to allow for more constructive dialogue as early as possible in the valuation process.
7. Support for this process will need to be sought from the USS trustees and the pensions regulator, recognising their statutory responsibilities. Both UCU and UUK will make the necessary approaches to seek this support.

8. Should this process prove acceptable to all parties this could provide the basis for the UCU to consult its branches and members on ending the industrial action currently underway within the sector.

TECHNICAL ANNEXES

ANNEX 4: ABOUT USS

The Universities Superannuation Scheme (USS) is one of the UK's largest occupational pension schemes and the largest when measured by assets under management. It is a private sector scheme, run under trust and regulated by The Pensions Regulator. The Scheme is an open mixed benefits scheme (i.e. it has defined benefit and defined contribution sections). It is one of only around 700 open defined benefit schemes today³⁰.

BENEFIT STRUCTURE

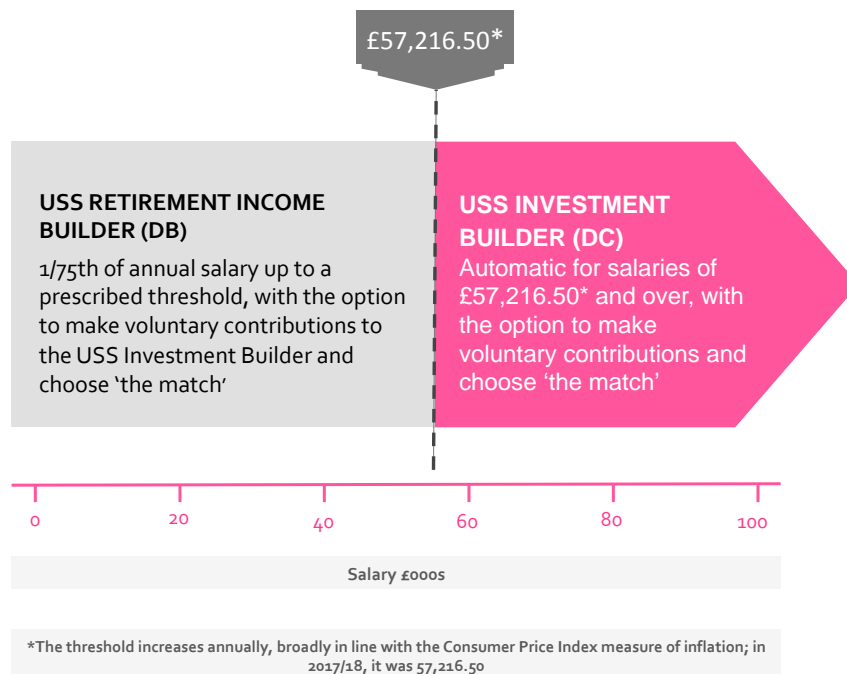
Today's benefit structure is a mix of defined benefit benefits (DB) and defined contribution (DC) benefits. Members today can build benefits as follows:

- **USS Retirement Income Builder:** This is the defined benefit (DB) section of the Scheme. Members accrue a pension of $1/75^{\text{th}}$ of annual salary (up to the 'salary threshold') for each year of service in the Scheme. The pension accrued in each year will be revalued from the year of accrual to retirement date in line with CPI. On retirement, members are also entitled to a tax-free lump sum of three times the gross value of their pension.
- **USS Investment Builder:** This is the defined contribution (DC) section of the Scheme. Members build up a DC fund for salaries above the salary threshold and contributions are invested in one of a range of funds from which the member can choose. For 2018/19, the salary threshold stood at £57,216.50. This increases each year (on 1 April) in line with CPI. In 2017, 82% of active members earned less than £55,000³¹, so were below the threshold for the Investment Builder. In other words, most eligible staff automatically accrued benefits only in the Retirement Income Builder.
- All members can also make **additional contributions** to the USS Investment Builder, even if their salary is below the salary threshold. The employer will match the first 1% of any additional contribution from the Scheme member. This is known as the 'Match'. Under the current proposals from the Trustee, the Match will cease. Just under 45,000 members (22%) have opted to take up the Match.

³⁰ Purple Book 2017, Pension Protection Fund. Figure refers to occupational pension Schemes within the PPF universe. www.pensionprotectionfund.org.uk

³¹ USS Investment Builder data tables by demographics, Table 4, shared with JEP

Figure 12: USS benefit structure

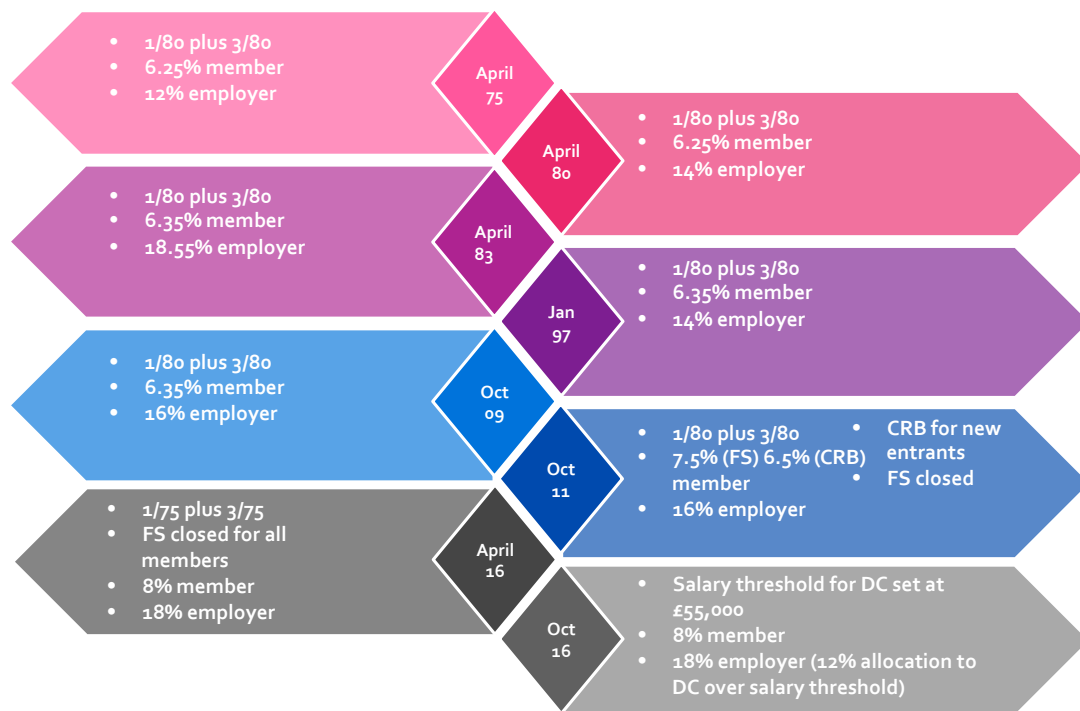


Source: USS

Pensions in payment and deferred pensions are increased annually. For service built up before October 2011, increases reflect the increases applied to 'official pensions', i.e. those paid to members of public service schemes such as the Teachers' Pension Scheme and the Civil Service Pension Scheme. Currently the annual increases to official pensions is CPI. For service built up after October 2011, USS will match the first 5% of the annual increases to official pensions. However, if official pensions increase by more than 5%, USS will pay half the difference up to a maximum increase of 10%.

The current benefit structure, set in October 2016, is itself a product of change, resulting from previous valuations, as set out in Figure 13.

Figure 13: History of USS benefit structure and contribution changes



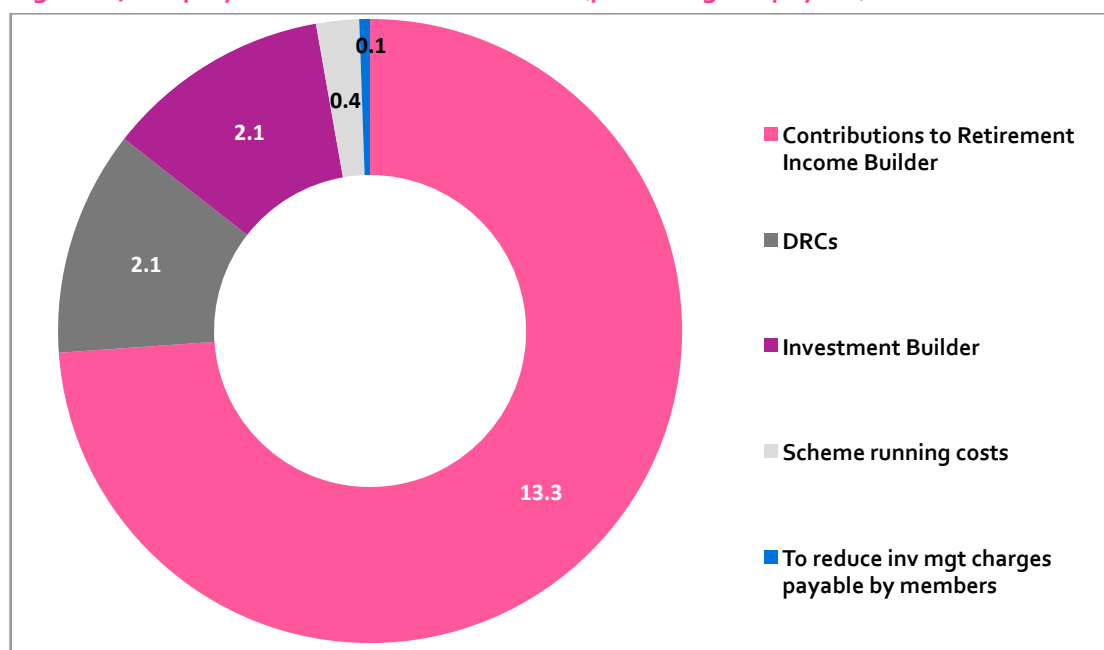
Source: USS

CONTRIBUTIONS

All Scheme members contribute 8% of salary up to the salary threshold to the Retirement Income Builder. For those earning over the salary threshold, 8% of the amount of their salary over the Salary Threshold is saved into the Investment Builder.

Employers contribute 18% of salary. Their contribution covers both sections of the Scheme, deficit recovery contributions and the Scheme's running costs. All participating employers have the same admission terms and all pay the same rate of contributions based on percentage of payroll regardless of their share of the liabilities or deficit. As a result, there are cross subsidies and an element of mutuality in the Scheme, which sets it apart from many other multi-employer Schemes. For example, the deficit is shared across employers regardless of the profile of their members.

Figure 14: Employer contribution breakdown (percentage of payroll)



Source: USS Annual Report and Accounts 2018

In the 2017/18 Scheme year employer contributions totalled £1.9bn (including salary sacrifice contributions of £0.5bn) and employee contributions generated £0.3bn of inflows³².

MEMBERSHIP

As at 31 March 2018 there were 418,964 Scheme members broken down between active, deferred and pensioner members as follows:

Figure 15: Membership by category 2014-2018

YEAR	2014	2015	2016	2017	2018
Total	316,440	365,703	373,110	396,278	418,964
Active	154,119	188,335	180,882	190,546	198,652
Deferred	104,453	115,288	128,043	139,313	151,119
Pensioner	57,868	62,080	64,185	66,419	69,193

Source: USS Annual Reports and Accounts 2018, 2017, 2016, 2015 & 2014. Note figures are as at Scheme year end, i.e. 31 March each year.

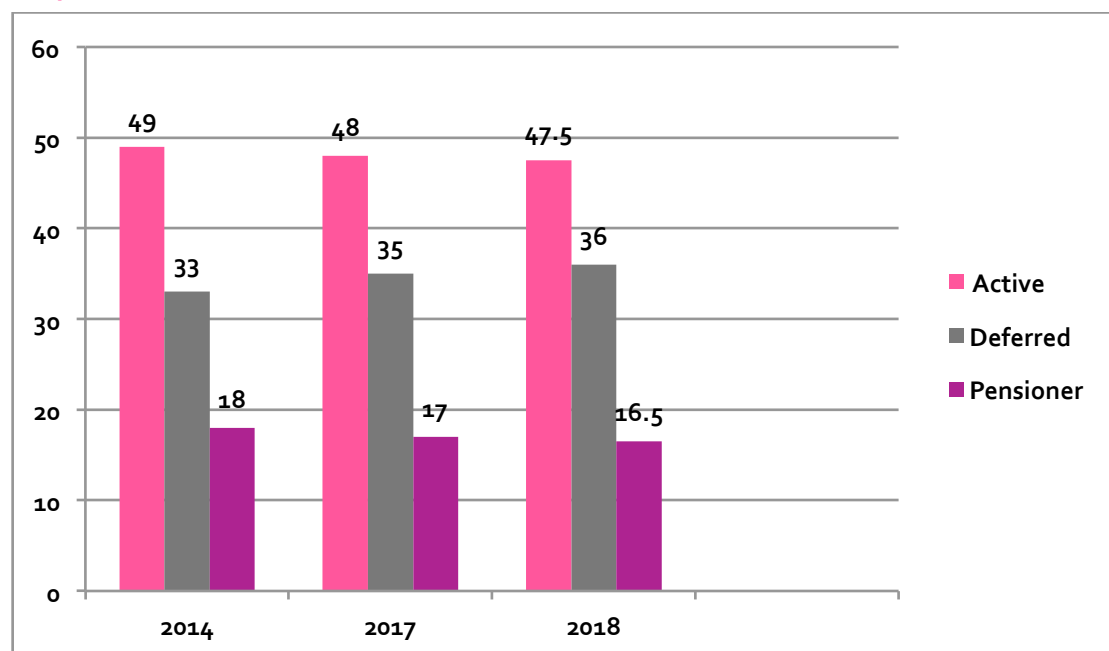
In addition, 12,035 dependents of Scheme members were drawing benefits from the Scheme as at 31 March 2018. (13,340, at March 31 2017; 12,704, March 31 2016.)

³² USS Annual Report and Accounts for the year ending 31 March 2018, p10

The majority of members are in University institutions. For example, there were 191,951 active members in University institutions (constituting 96.6% of the active membership) as at 31 March 2018 and 6,701 actives in non-University institutions (constituting 3.4%).

Between the valuation periods, membership has grown quite significantly, but proportions in the different categories of membership remained fairly constant.

Figure 16: Scheme membership (proportion of total membership) by category 2014, 2017 and 2018



28,716 new active members joined the Scheme in 2017/8 (29,475 in 2016/17³³) and almost 70,000 pensions were in payment³⁴. Membership can be further broken down by demographic profile: 59% of members were age 45 or younger.

As at 31 March 2018 there were 74,093 active members in the Investment Builder (DC) section, comprising 37.3% of the active membership (64,902 as at 31 March 2017). Most of these members are accruing benefits in both the Retirement Income Builder and the Investment Builder sections. Just over 40,000 were automatically members of Investment Builder as a result of earning over the salary threshold. Of the 198,652 active members who were eligible to pay the Match and thereby receive an additional contribution of 1% of salary from their employer, only 44,888 members paid towards the Match (22.6% of active members)³⁵.

³³ USS Annual Report and Accounts for the year ending 31 March 2017

³⁴ USS Annual Report and Accounts for the Year ending 31 March 2018, p14

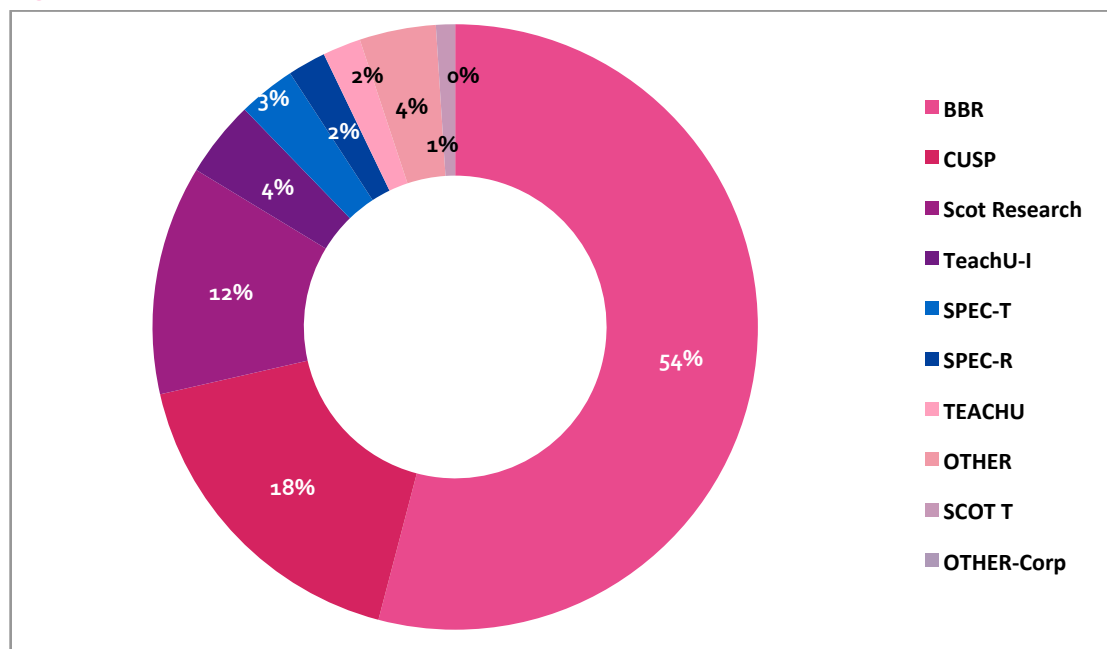
³⁵ USS information provided to JEP in evidence session, June 6 2018

LIABILITIES

In September 2017 (the date of the consultation on the 2017 valuation) accrued liabilities stood at £67.5bn³⁶. This was an increase on the position at the 2014 valuation when technical provisions stood at £46.9bn³⁷.

These liabilities are not spread evenly across the sector. Analysis by EY Parthenon for USS, and shared by the Trustee with the JEP, shows that liabilities at broad-based research institutions (defined by EY Parthenon as “Russell Group plus Oxbridge, UK universities with a strong research focus”) represent a 54% share of the Scheme’s liabilities. A detailed breakdown is shown in Figure 17 below³⁸:

Figure 17: Deficit share by sector



Source: EY Parthenon

Liabilities are projected to grow still further. This reflects the fact that the Scheme is an open scheme in which members continue to accrue benefits. Of concern to TPR has been the speed at which liabilities have grown (and will continue to grow) relative to the growth of the sector. However, analysis undertaken by the Trustee and shared with the JEP shows

³⁶ USS presentation to JEP 6 June 2018 – numbers taken from 2017 Actuarial Valuation: a consultation with Universities UK on the proposed assumptions for the Scheme’s technical provisions and Statement of Funding Principles, USS, 1 September 2017, p8

³⁷ 2017 Actuarial Valuation: a consultation with Universities UK on the proposed assumptions for the Scheme’s technical provisions and Statement of Funding Principles, USS, 1 September 2017, p8

³⁸ EY Parthenon & PwC data shared with JEP

that, in real terms, the size of the Scheme is – in fact – expected to fall relative to the size of the sector over the next 20 years.

The USS analysis compares the size of the Scheme relative to the size of the sector by looking at the Scheme’s liabilities overtime alongside the value of the payroll (payroll being a proxy for the size of the sector). Figure 18 below shows the Scheme’s self-sufficiency position as at 31 March 2017, and two estimates of the position as at 31 March 2037, all expressed in today’s prices. Values have been produced under two scenarios:

- gilt yield reversion occurs, consistent with the Trustees’ best estimate basis; and
- current market conditions expectations of gilt yields as represented by forward rates are borne out (i.e. no gilt yield reversion occurs).

Demographic assumptions made for the 31 March 2017 valuation are assumed to hold (i.e. the active Scheme membership remains stable in terms of numbers, salary distribution and age profile etc; and demographic experience, including mortality, also remains in line with the assumptions adopted in the March 2017 valuation assumptions). It is also assumed that the Scheme continues to provide the current level of benefits and that payroll grows in line with economic growth (i.e. CPI +2%).

Figure 18: Size of the Scheme relative to the sector in real terms

	31 March 2017	31 March 2037 assuming reversion	31 March 2037 no reversion, i.e. current forward gilt yields
1 Self-sufficiency liability	£82bn	£81bn	£104bn
2. Value of 7% of payroll over 20 years	£13bn	£17bn	£19bn
3. Payroll	£8bn	£12bn	£12bn
4. Self-sufficiency as a multiple of 7% of payroll for 20 years: (1)/(2)	6.3	4.8	5.5
5. Self-sufficiency liability as a multiple of employer’s risk appetite assuming the risk appetite is kept constant in real terms (ie £13bn): (1)/£13bn	6.3	6.2	8.0

Figure 18 demonstrates that the size of the Scheme is expected to fall relative to the growth in the sector assessed against payroll growth. The main reason for this is the change in

benefits that occurred in 2016, when benefits for pre-2011 members were changed from final salary to career re-valued benefits which and has limited the Scheme's liabilities. Figure 18 also shows that the if the measure of risk that employers are willing to take remains constant, the size of the Scheme also does not grow relative to the employers' appetite for risk (assuming some gilt yield reversion). The Scheme will only grow relative to the employers' risk appetite in circumstances where gilt yield reversion does not occur.

Further detail is provided in Technical Annex 7.

The Scheme's relative immaturity means that the Scheme is projected to be cashflow positive for the next fifty years. This sets it apart from most other occupational schemes which are cashflow negative.

ACCOUNTING FOR PENSION COSTS

Since December 2016, universities have been required to publish their financial results under a new accounting standard known as FRS102, interpreted for the sector by the Further Education and Higher Education Statement of Recommended Practice (SORP). This change has only affected institutions that participate in USS and The Superannuation Arrangements of the University of London (SAUL).

The result has been to make pension deficits more visible on many institutions' balance sheets. Previously, for many organisations, pension costs were simply the amount of employer contributions paid into the Scheme and, as these were treated as operational expenditure, there was no balance sheet impact. This was because the schemes (USS and SAUL) were non-segregated, in other words the assets and liabilities applicable to individual institutions could not be identified discretely.

Now, under FRS102, organisations participating in a multi-employer scheme with non-segregated assets must recognise:

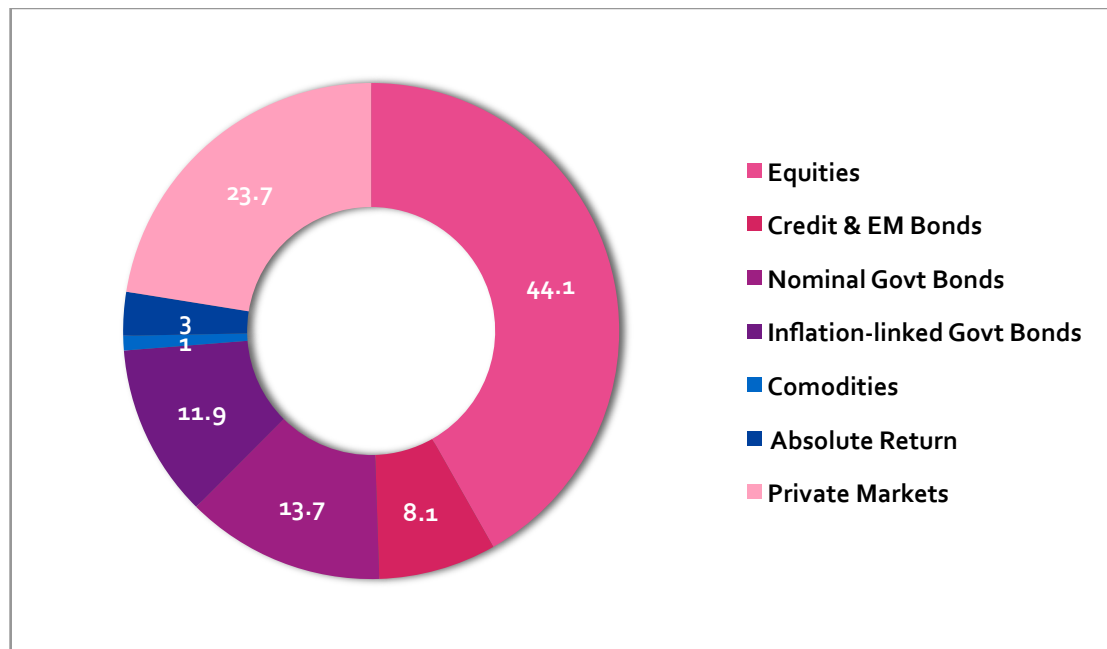
- A liability in their balance sheet equal to the net present value of future deficit reduction payments. These payments are discounted to the present value using the market yield on high quality corporate bonds.
- A finance cost in their profit and loss account equal to the 'unwinding of the discount rate'. This will be broadly equivalent to the annual deficit payment.

It brings the Scheme and participating employers into line with practice for the other, private sector, occupational pension schemes.

ASSETS UNDER MANAGEMENT

USS holds £63.6bn in assets as at 31 March 2018. The value has risen from £60.0bn in March 2017. In 2014, the date of the previous valuation, assets stood at £41.6bn and in 2010 £29.9bn³⁹. Asset allocation at 2018 broke down as follows:

Figure 19: USS Retirement Income Builder - asset allocation (%) as at 31 March 2018



At 31 March 2018, the investment returns for the USS Retirement Income Builder were +6.2% over the year to 31 March 2018 and +10.6% a year over the last five years.

Investment performance is measured against a benchmark called the Reference Portfolio which is a hypothetical portfolio that provides a long-term benchmark for measuring the value added, and the level of risk in, the approach adopted by USSIM (the Trustee's internal asset management company) to managing the Scheme's assets. The aim is for the Retirement Income Builder assets to outperform the Reference Portfolio by 0.55% or more a year on an annualised basis over rolling five-year periods to 31 March. The out-performance over the Reference Portfolio was +1.44% over the year to 31 March 2018 and over the five-year period to March 31 2018 exceeded the benchmark by 0.78% a year, net of costs⁴⁰.

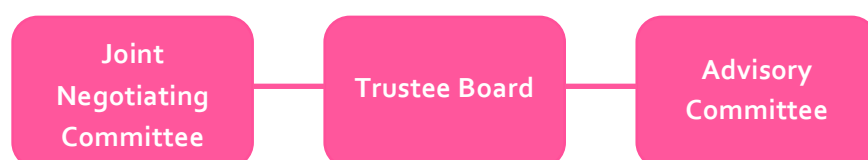
³⁹ USS Annual Report and Accounts 2014. Available at uss.co.uk

⁴⁰ USS Annual Report and Accounts 2018. Available at www.uss.co.uk

GOVERNANCE

Reflecting its scale and complexity, the governance of USS is more complex than that of many other large pension funds.

Figure 20: USS governance structure



- The **Board of Directors** of the Trustee company (USS Limited) comprises four employer-nominated directors (including the Board Chair); three union-nominated Directors; and between three and five independent directors (currently five are appointed). The Trustee has the sole power through a unilateral right in the Scheme Rules to set contributions (subject to consultation). This is unlike most other pension schemes, where the approach to setting contributions is one of partnership between the trustees and sponsoring employer. The Trustee may also propose changes to the Scheme Rules. Such proposals require the consent of the JNC.
- The **JNC** is a body established under the Rules and has a vital role in running USS. The JNC has no formal role in setting the valuation assumptions. As such, the Trustee cannot formally consult or take into consideration the JNC's views but can consult informally. The JNC has a role once the valuation is completed. Then it is responsible for considering how any change in the contribution rate is to be applied under the Scheme Rules (rules 64.10 and 76). This may include changes to future benefits, future contributions or a balance of the two. The JNC is made up of equal number of UUK and UCU representatives, with an independent chair appointed by the Committee itself.

USS is also unusual in that it is a 'last man standing scheme'. This means that the pension liabilities of failed institutions within the Scheme will fall to the remaining institutions. In extremis, it would mean that the last remaining institution would take on all the pension liabilities in the Scheme. It is only once this – last – institution has failed that the Scheme can call on the Pension Protection Fund.

However, as noted earlier in this report, it should be noted that employer failure in USS has occurred rarely, and even then in smaller institutions. Where institutions 'fail' they will be likely to merge with larger, stronger institutions. Students will go to other institutions with the result that their tuition fees are not lost to the sector.

ANNEX 5: SPECIMEN SLIDES FROM THE EY PARTHENON REVIEW OF THE HIGHER EDUCATION SECTOR

The UK HE Market in the Global Context: Executive Summary

The market fundamentals for global higher education remain positive

Demand	Supply
<ol style="list-style-type: none"> 1. Across the board globally, tertiary enrolment ratios are continuously increasing <ul style="list-style-type: none"> • Partly a wealth phenomenon as more less economically developed countries are crossing the PPP thresholds for middle-class demand for education • Partly a political phenomenon as world leaders understand that tertiary education is necessary to compete in a value-add service economy 2. Global demand for tertiary education is reaching its apex, as China and India reach the inflection point for HE demand <ul style="list-style-type: none"> • Since the founding of the University of Bologna in 1088, we have created ~180M university places globally. In the next 10 years, we will need another ~100M • "Accommodating the additional 0.8 billion students would require more than four major universities to open every week for the next fifteen years" – Stananka Uvalić-Trumbić, former Chief of the Higher Education Section, UNESCO, 2011 	<ol style="list-style-type: none"> 1. The UK HE brand is currently highly-regarded, with a high number of globally-ranked institutions attracting international students 2. Source countries will not generate enough domestic places, let alone domestic places at high-quality, globally-ranked institutions, to capture share from UK HE 3. Alternative sources of supply is unlikely to have a material impact to supply of high quality places

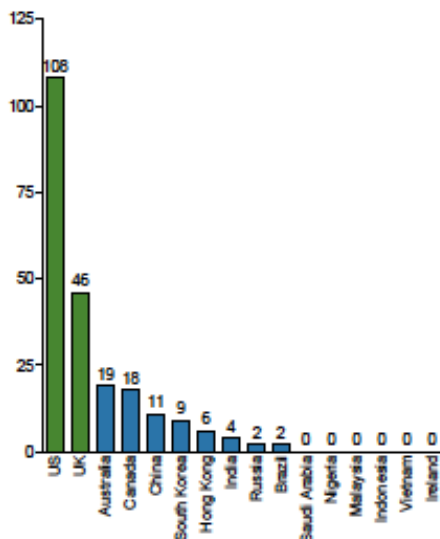
Parthenon

DRAFT 8

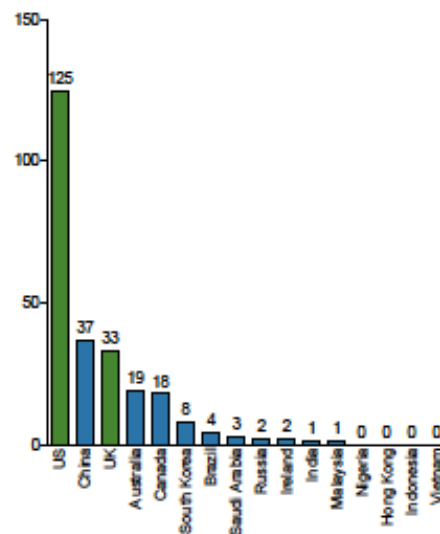
The UK HE Market in the Global Context: Executive Summary

The UK has one of the highest reputations for HE provision globally...

Number of Universities in Top 400, Times Higher Education Rankings, 2016



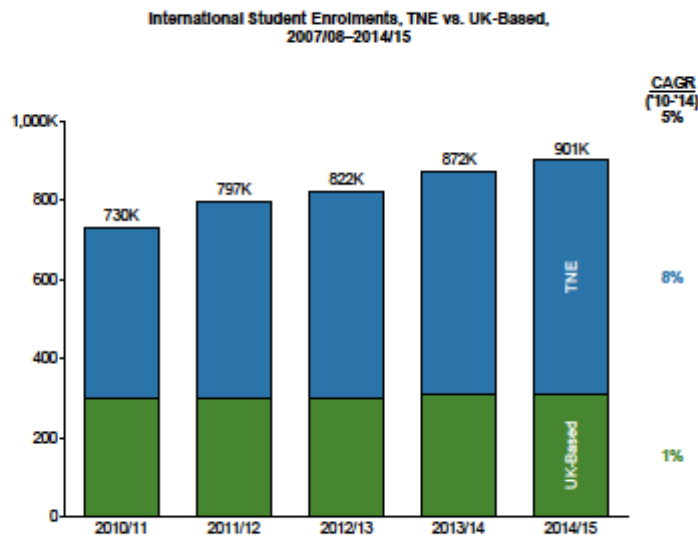
Number of Universities in Top 400, Shanghai Rankings, 2016



Parthenon. Source: Shanghai University Rankings, Times Higher Education University Rankings

DRAFT 10

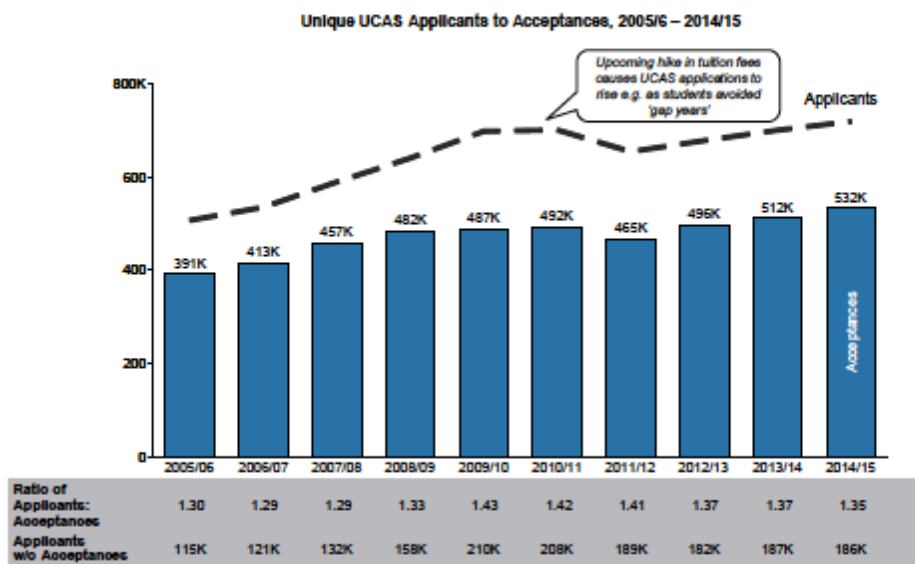
The UK HE Market in the Global Context: Executive Summary ...and continues to attract both students abroad...



Parthenon Source: HESA, British Council

DRAFT 11

The UK HE Market in the Global Context: Executive Summary ...and in the UK, driven by the labour market outcomes associated with a UK higher education experience

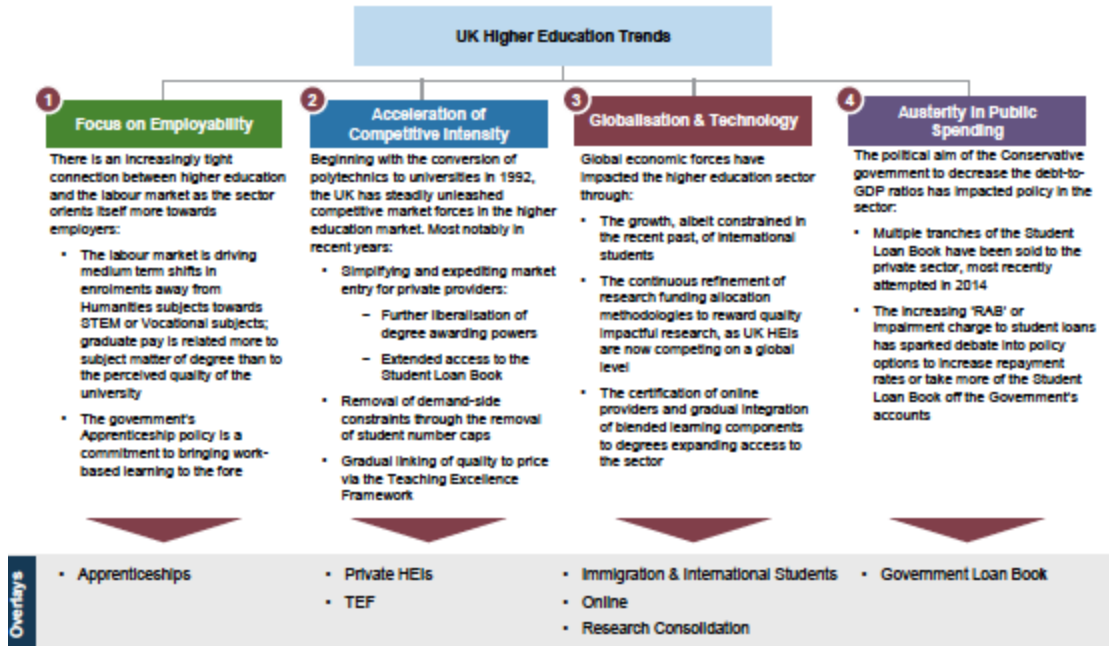


Parthenon Source: UCAS

DRAFT 12

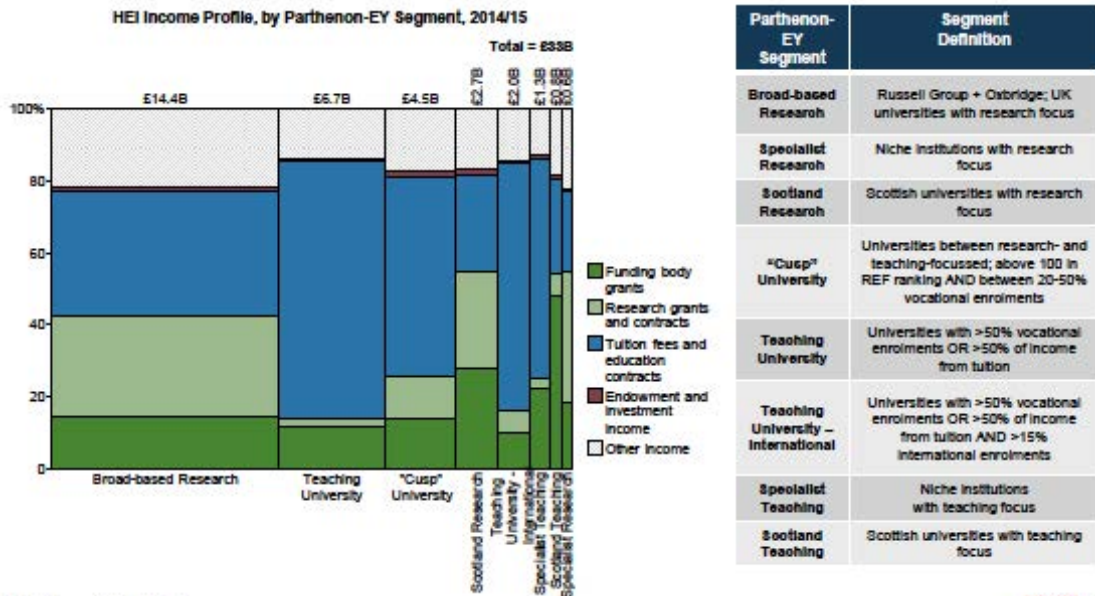
HE Market Overlays: Executive Summary

There are four broad market forces currently impacting higher education in the UK



HE Market Overlays: Executive Summary

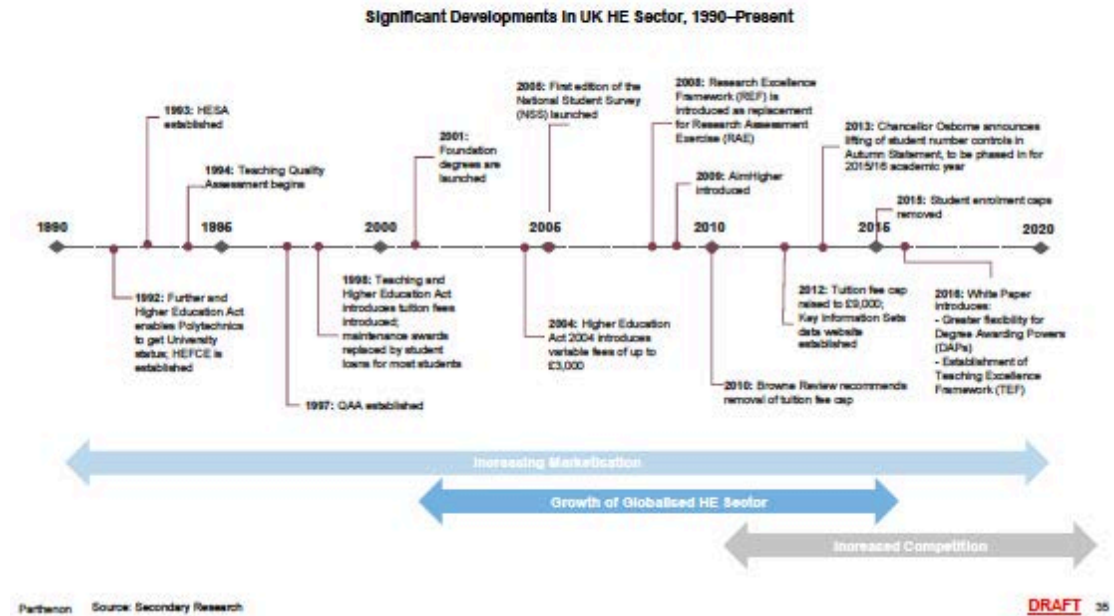
We have segmented all UK HEIs into 8 segments that share characteristics related to their income profile and institutional focus



DRAFT 14

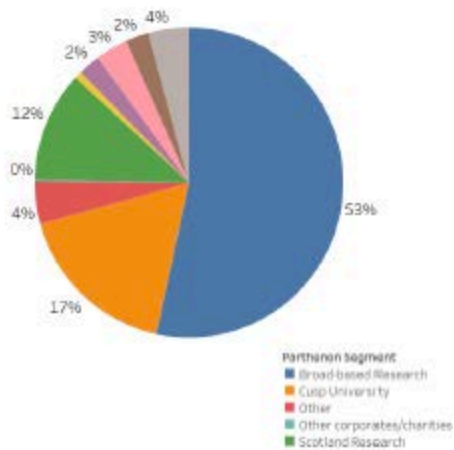
Higher Education Market Overview: Historical Context

The UK's higher education sector has undergone significant evolution over the last 25 years...

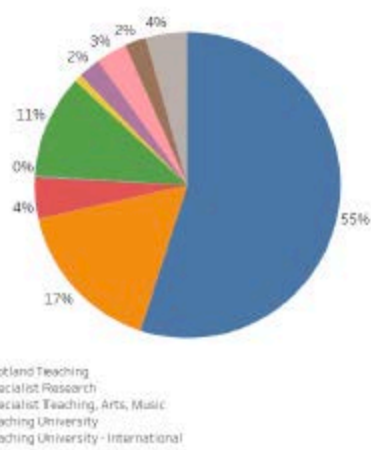


ANNEX 6: SPECIMEN SLIDES FROM THE PwC COVENANCE ASSESSMENT OF USS

Deficit share by Parthenon Segment (2017)



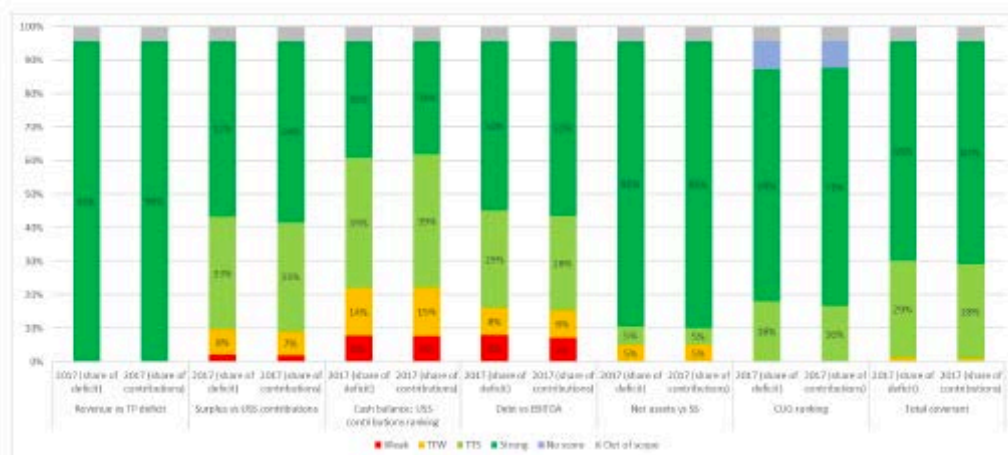
Contributions by Parthenon Segment (2017)



Conclusion: There are no material differences between the percentage represented by each Parthenon segment when broken down by deficit share compared to the breakdown by share of contributions.

*Please note, 'Other' includes Oxbridge colleges and other charities & corporates.

Key covenant metrics illustrated by deficit share and contribution share (2017)



Conclusion: Using both methods to calculate covenant strength (by share of deficit and share of contributions) produces fairly consistent results.

The Oxbridge colleges and other charities & corporates are out of scope for the purposes of our analysis above.

The outlook for the sector is very long term and there is reasonable visibility on the employer covenant for 30 years (1 of 3)

As discussed with the JEP at our meeting on 6 August 2018, we set out below the rationale supporting our 2016 conclusion that there is reasonable visibility of the covenant for 30 years. It is noted that the USS valuation methodology assumes the sector can support the scheme for more than 30 years. We are comfortable with this approach as we consider institutions will continue to be able to provide support after 30 years, but the strength of this support is less visible. We set out the reasons for this latter point on the next two pages.

Factors to support the 30 year visibility on employer covenant (2016):

- 1** Long term demand of high quality education is expected to outstrip global supply as university sectors in developing countries such as China take a number of years to build reputation and research capabilities.
- 2** Of the top 400 universities in the world per the Top 400 Times Higher Education ranking, 2015, 11% (45) are based in the UK.
- 3** Key downside sector risks identified by Parthenon-EY unlikely to have a material effect on revenue.
- 4** A number of universities have high investment grade credit ratings with some having borrowed generally unsecured debt on terms of 40 or 50 years.
- 5** Commentators reference the high likelihood of extraordinary support from the UK Government in the event of acute stress.
- 6** We are unaware of any insolvencies in the sector, with stressed universities merging with another institution or cutting costs over a short timeframe to remain viable.

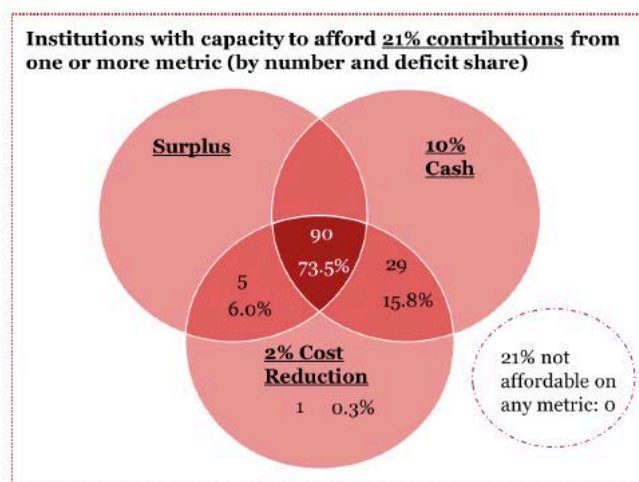
PwC

Strictly private and confidential

August 2018

Analysis of key financial metrics indicates that all 125 institutions covered by HESA data have capacity to afford an increase in contributions to 21% using either surplus or cash or 2% cost saving

We've also considered on the following slides the capacity to fund these contribution levels by Parthenon sub-sector.



USS employer covenant review
PwC

Strictly private and confidential

3 July 2018
14

ANNEX 7: GROWTH OF USS RELATIVE TO THE HIGHER EDUCATION SECTOR

USSADD06: Estimate of the size of the scheme relative to the sector

One way of comparing the size of the scheme relative to the sector is to look at the relative value of the scheme's liabilities over time alongside the annual value of the payroll (payroll being a proxy for the size of the sector).

The table below sets out the scheme's self-sufficiency position as at 31 March 2017, and estimates of the position as at 31 March 2037 in real terms. In estimating the self-sufficiency liability at 31 March 2037 figures have been produced under two scenarios, allowing for:

- gilt yield reversion consistent with that allowed for in the trustee's best estimate basis; or
- current market expectations as represented by forward rates (i.e. the current gilt yields) being borne out.

In calculating the liabilities at 31 March 2037 it has been assumed:

- the active population remains stable in terms of numbers, salary distribution and age profile.
- the payroll grows in line with economic growth (assumed to be CPI + 2% p.a. over the whole period).
- the scheme provides the current level of benefits.
- the demographic experience (including mortality) of the scheme is in line with the assumptions adopted at the 31 March 2017 valuation.

Size of Scheme relative to the sector in real terms

	31 March 2017	31 March 2037 assuming reversion	31 March 2037 no reversion (i.e. current forward gilt yields)
1. Self-sufficiency liability	£82bn	£81bn	£104bn
2. Value of 7% of payroll over 20 years	£13bn	£17bn	£19bn
3. Payroll	£8bn	£12bn	£12bn
4. Self-sufficiency as a multiple of 7% of payroll for 20 years: (1)/(2)	6.3	4.8	5.5
5. Self-sufficiency as a multiple of employer's risk appetite assuming the appetite is kept constant in real terms (i.e. £13bn): (1)/£13bn	6.3	6.2	8.0

What the above table demonstrates is that:

- in real terms the size of the scheme is expected to fall relative to the size of the sector, the main reason for this is the change in benefits that occurred in 2016 when benefits for the pre 2011 members were changed from final salary to career revalued benefits.
- if the measure of risk is kept constant in real terms, which is consistent with the employers' wish not to increase reliance over time (i.e. the employers' risk appetite), then:

- The scheme does not grow relative to the employers' risk appetite assuming the expected path of interest rates (moderate reversion over 10 years).
- The scheme grows relative to the employers' risk appetite if there is no reversion in gilt yields.

██████████
20 July 2018

The purpose of this note is to address a question raised by the Joint Expert Panel in discussions with the trustee.

The numbers shown have been previously calculated for specific purposes and are provided in this note for information only and do not constitute advice.

The trustee accepts no liability or responsibility to any third party including members of the Joint Expert Panel in respect of the numbers contained in this document and recommends any recipient take their own advice, including actuarial, before taking any decisions using any information provided in this note.

This document is covered by the confidentiality agreement in place between USSL and the members of the Joint Expert Panel.

Restricted Business Sensitive (RBS)



ANNEX 8: ADD₁₃ CONTRACTION OF HIGHER EDUCATION SECTOR BY 20%, EFFECT ON CONTRIBUTION REQUIREMENTS

1

USSADD13: Contraction of the HE sector by 20%, effect on pension contribution requirements?

The potential contraction of the higher education sector such that the membership of the scheme fell by 20% would affect the contribution requirements and technical provisions in the following ways:

- any deficit would be spread over a smaller payroll;
- the maximum reliance that the sector could support (measured by 7% percent of payroll over a twenty year period) would reduce; and
- the build-up of benefits over the next 20 years would also reduce.

Taking each point in isolation:

- a deficit being spread over a smaller payroll will require a higher contribution rate as a percentage of payroll;
- the reduced maximum reliance that the sector can support would lead to lower discount rates and as such higher required contributions and technical provisions;
- the slower build-up of benefits would lead to the ability to take more investment risk in respect of the same risk appetite, resulting in a higher discount rate, giving lower contribution requirements and lower technical provisions.

The combined effect is dependent on how these elements interact.

Assuming an instantaneous contraction of the sector by 20% in membership and payroll as at 31 March 2017 (uniformly across the scheme's active membership profile) and that the current benefits are maintained, the overall impact on the long term discount rate (from 20 years onwards) is a reduction of circa 5bps.

The lower discount rate and payroll result in the following:

- The deficit increases from £7.5bn to £7.8bn (an increase of £0.3bn)
- The future service rate increases by **+0.3%** of payroll (from 31.4% to 31.7%)
- Deficit contributions would need to increase, to reflect the increased deficit and the lower payroll, by **+1.6%** p.a. to 7.6% p.a. of payroll from 6% p.a. (assuming the same parameters for the recovery plan in terms of the term and allowance for out-performance relative to the best estimate returns).

Overall therefore the contribution rate would therefore increase by **+1.9%** of payroll.

The precise impact would depend on how, if at all, the membership profile changes and the time period over which such a contraction occurred.

20 July 2018

The purpose of this note is to address a question raised by the Joint Expert Panel in discussions with the trustee.

The numbers shown have been based on previously calculated figures for specific purposes and are provided in this note for information only and do not constitute advice.

The trustee accepts no liability or responsibility to any third party including members of the Joint Expert Panel in respect of the numbers contained in this document and recommends any recipient take their own advice, including actuarial, before taking any decisions using any information provided in this note.

This document is covered by the confidentiality agreement in place between USSL and the members of the Joint Expert Panel.

Restricted Business Sensitive (RBS)



ANNEX 9: ADD₃₆ VALUATION EXPERIENCE

Restricted business sensitive (RBS)

USSADD36: Experience since 31 March 2017

This response sets out the estimated impact of changes in experience since 31 March 2017 up to 31 March 2018. The figures in this paper reflect estimations made subsequent to 31 March 2018 and have not been through the normal rigorous process that we perform in an actuarial valuation. As a result the figures are subject to change.

The experience we considered falls into three key areas:

- Market developments (changes in the financial markets and economic outlook);
- New data availability (e.g., new mortality experience data);
- Refinements to models (e.g., refinements to the FBB expected returns forecasting model).

The relevant developments that fall into these categories are as follows:

- **Change in real gilt yields:** Since 31 March 2017 we have seen continued volatility in real interest rates as measured by the yield available on index linked gilts with a potential upwards trend (see Figure 1 below), albeit at 31 March 2018 the yield on the 20-year instrument was only 6bps higher than a year earlier.



- **Realised investment returns:** The investment return achieved over the year is greater than the expected return assumed in the valuation and hence substantially above the assumed liability discount rate. The majority of the scheme's liabilities increase each year on 1 April with reference to CPI as measured over the 12 months to the previous September. The investment return achieved over the 12 months to 31 March 2018 exceeded the CPI increase granted at 1 April 2018 by 3% (6.0% investment return and 3.0% pension increases). This compares to a real discount rate assumed in the valuation of -0.53%. This is estimated to reduce the deficit by £2.1bn.

Restricted business sensitive (RBS)

- **An additional year of mortality experience:** Although we have not yet analysed the USS experience, general population data indicates that we have experienced lower mortality improvements than expected. We are currently in the process of analysing the scheme's most recent experience. Should this show a similar pattern to that of the general population it might reduce the accrued liabilities by approximately 0.5% or £0.3bn.
- **Expected investment returns:** The expected returns on the different asset classes which make up the reference portfolio have changed. This reflects both market developments and refinements to the model, including additional data that has become available since 31 March 2017. Preliminary results suggest that the expected real investment return for the current reference portfolio over the term of the liabilities on a best estimate basis will increase by c. 30bps and the real discount rate by c. 20bps.

More details of the potential impact of the above developments upon assumptions are given in Annex A. The impact is summarised in Table 1.

Figures in Table 1 as at 31 March 2018 have been calculated using the same demographic assumptions adopted for the 2017 valuation with the exception of mortality where an adjustment has been made of 0.5% of liabilities, based on general population data as described above. The discount rate used reflects the FBB forecast of investment returns as at 31 March 2018. Figures in the table for 2018 should be considered as indicative of the position at that date. If a new valuation were to be undertaken at that date, additional work would be required to confirm the appropriateness of the assumptions and, in particular, the expected investment return and discount rate structure. These estimates adopt the same principles around covenant and reliance etc. as used for the 2017 valuation. Updated membership data as at 31 March 2018 would also need to be produced and analysed (these figures are estimated based on the 2017 membership data rolled forward).

The key messages that can be taken from the Table 1 are:

- The deficit has fallen by £3.5bn to £4.0bn from £7.5bn.
- Whilst the future service cost has decreased it is not as significant as the change in the deficit: the future service contribution falls by just 0.9% from 31.4% to 30.5%.

These indicative results suggest that the change in experience since 31 March 2017 has a greater impact on the deficit than on the future contribution requirement.

The higher self-sufficiency liability at 31 March 2018 relative to a year earlier is explained by the additional benefits which have accrued in the year being greater than the reduction in liabilities due to the slight improvements in yield for self-sufficiency.

Table 2 provides a reconciliation of the deficit at 31 March 2017 with that at 31 March 2018.

- **An additional year of mortality experience:** Although we have not yet analysed the USS experience, general population data indicates that we have experienced lower mortality improvements than expected. We are currently in the process of analysing the scheme's most recent experience. Should this show a similar pattern to that of the general population it might reduce the accrued liabilities by approximately 0.5% or £0.3bn.
- **Expected investment returns:** The expected returns on the different asset classes which make up the reference portfolio have changed. This reflects both market developments and refinements to the model, including additional data that has become available since 31 March 2017. Preliminary results suggest that the expected real investment return for the current reference portfolio over the term of the liabilities on a best estimate basis will increase by c. 30bps and the real discount rate by c. 20bps.

More details of the potential impact of the above developments upon assumptions are given in Annex A. The impact is summarised in Table 1.

Figures in Table 1 as at 31 March 2018 have been calculated using the same demographic assumptions adopted for the 2017 valuation with the exception of mortality where an adjustment has been made of 0.5% of liabilities, based on general population data as described above. The discount rate used reflects the FBB forecast of investment returns as at 31 March 2018. Figures in the table for 2018 should be considered as indicative of the position at that date. If a new valuation were to be undertaken at that date, additional work would be required to confirm the appropriateness of the assumptions and, in particular, the expected investment return and discount rate structure. These estimates adopt the same principles around covenant and reliance etc. as used for the 2017 valuation. Updated membership data as at 31 March 2018 would also need to be produced and analysed (these figures are estimated based on the 2017 membership data rolled forward).

The key messages that can be taken from the Table 1 are:

- The deficit has fallen by £3.5bn to £4.0bn from £7.5bn.
- Whilst the future service cost has decreased it is not as significant as the change in the deficit: the future service contribution falls by just 0.9% from 31.4% to 30.5%.

These indicative results suggest that the change in experience since 31 March 2017 has a greater impact on the deficit than on the future contribution requirement.

The higher self-sufficiency liability at 31 March 2018 relative to a year earlier is explained by the additional benefits which have accrued in the year being greater than the reduction in liabilities due to the slight improvements in yield for self-sufficiency.

Table 2 provides a reconciliation of the deficit at 31 March 2017 with that at 31 March 2018.

Restricted business sensitive (RBS)

Table 1. Indicative results of the 31 March 2018 update with 31 March 2017 for comparison

	31 March 2017 valuation		31 March 2018 indicative position based on 2017 methodology	
	Best estimate	Technical Provisions	Best estimate	Technical Provisions
Market value of assets	£60.0bn		£63.6bn	
Accrued liability (TP)	£54.8bn	£67.5bn	£54.6bn	£67.6bn
Deficit on TP basis	-£5.2bn (surplus)	£7.5bn	-£9.0bn (surplus)	£4.0bn
Self-sufficiency (SS)	£82.4bn		£84.5bn	
Deficit on SS basis	£22.4bn		£20.9bn	
Total Contributions (employer + employee):				
<i>Future service cost</i>	23.9%	31.4%	23.0%	30.5%
<i>Deficit contribution</i>	0%	6%	0%	TBC
<i>Total contribution</i>	23.9%	37.4%	23.0%	TBC
Average discount rate (p.a.) above current gilt yields	2.3%	1.2%	2.5%	1.3%
Average discount rate (p.a.) above CPI	1.8%	0.7%	2.1%	0.9%

Table 2 Reconciliation of deficits at 31 March 2017 and 2018

Reconciliation of deficit	
Deficit at 31 March 2017	£7.5bn
<i>Reduction in deficit:</i>	
• Change in financial assumptions	-£1.5bn
• Investment return in excess of assumed	-£2.1bn
• Mortality experience	-£0.3bn
<i>Increase in deficit:</i>	
• Contributions made less than the cost of new benefits accrued	+£0.4bn
Estimated deficit at 31 March 2018	£4.0bn

27 July 2018

The purpose of this document (including the appendix) is to address questions raised by the Joint Expert Panel in discussions with the trustee.

The numbers shown have been previously calculated for specific purposes and are provided for information only and do not constitute advice.

The trustee accepts no liability or responsibility to any third party including members of the Joint Expert Panel in respect of the numbers contained in this document (including the appendix) and recommends any recipient take their own advice, including actuarial, before taking any decisions using any information provided in this note.

This document (including the appendix) is covered by the confidentiality agreement in place between USSL and the members of the Joint Expert Panel.

Restricted business sensitive (RBS)

Annex A:
Changes in assumptions to reflect experience since 31 March 2017

1. Interest rate reversion

The 2017 valuation allowed for real interest rates to increase at a greater rate, and to a higher level, than implied by the market. The amount of reversion is in line with the approach developed by USSIM in the Fundamental Building Blocks (FBB) methodology, as approved by the trustee previously and by the Investment Committee. Table 2 below compares the expected amount of yield reversion under the FBB approach as of 31 March 2017 with that as of 31 March 2018. The rationale for the lower amount of reversion at 31 March 2018 is that the FBB methodology gives a relatively high weight to post GFC historical average (40% weighting), which now points towards lower terminal rates. This is not offset by the forward curve (40% weighting), which has not shifted to a significant extent since March 2017.

Table 1. Comparing forward breakeven yields with best estimate forecasts for 20-year real yields. (All market yields are sourced from Bloomberg).

20-year real yields (p.a.)	Current yields	Projection of yields in 10 years under FBB
31 March 2017	-1.74%	-0.25%
31 March 2018	-1.68%	-0.37%

2. Expected investment returns

Table 2 gives more detail on the indicative expected FBB returns as at 31 March 2018 compared with the corresponding 2017 returns. As indicated above at this stage these returns have not been through the same process that would be applied at a formal valuation.

Table 2. FBB expected returns (p.a.) as of 31 March 2018, compared with 31 March 2017. (The 2018 expected returns are indicative and subject to change).

Expected Returns	Date	30-yr Exp Real Return	30-yr Exp Nominal Return	10-yr Exp Real Return	10-yr Exp Nominal Return	10-yr Fwd 20-yr Exp Real Return
Reference Portfolio relative to CPI	31 Mar 2018*	3.15%	5.35%	1.65%	3.82%	3.91%
Reference Portfolio relative to CPI	31 Mar 2017	3.00%	5.30%	0.97%	3.23%	4.03%

* Indicative only and subject to change.

The higher expected return in the first 10 years at 31 March 2018 compared to that from 31 March 2017 results from:

- Lower expected reversion of index-linked gilts yields this is being driven by lower post GFC average real yields.

- Improvement in data quality for fundamentals and lower UK valuation multiples after a recovery in corporate earnings which have led to an upwards revision of equity returns both in the first ten years and thereafter.
- Revision of the model for property to align expectations to the benchmark of USSIM mandate which has reduced expected returns.

3. Discount rate

Table 3 details the indicative best estimate and technical provisions discount rates at 31 March 2018, together with 2017 figures. Note that the figures for 2018 are indicative as they have not been through the same process as would be applied at a full valuation.

Table 3. Best estimate and discount rate assumptions.

Period	31 March 2017 valuation		31 March 2018 indicative assumptions*	
	Best estimate	Technical Provisions	Best estimate	Technical Provisions
Years 1-10	CPI + 1.0% <i>reducing linearly to</i> CPI + 0.08%	CPI – 0.53% <i>reducing linearly to</i> CPI – 1.32%	CPI + 1.65% <i>reducing linearly to</i> CPI + 0.78%	CPI +0.17% <i>reducing linearly to</i> CPI – 0.61%
Years 11-20	CPI + 3.54% <i>reducing linearly to</i> CPI + 2.56% <i>by year 21</i>	CPI + 2.56% <i>reducing linearly to</i> CPI + 1.7% <i>by year 21</i>	CPI + 3.43% <i>reducing linearly to</i> CPI + 2.45% <i>by year 21</i>	CPI + 2.45% <i>reducing linearly to</i> CPI + 1.5% <i>by year 21</i>
Years 21+	CPI + 2.56%	CPI + 1.7%	CPI + 2.45%	CPI + 1.5%

* Indicative only and subject to change.

The lower discount rate after 20 years at 31 March 2018 compared to that from 31 March 2017 primarily results from the lower long term gilt yield.

4. Mortality

USS mortality experience has not yet been analysed over the 2017 year, but UK general population data showed more deaths occurred in the year than expected. The Scheme Actuary has indicated if the Scheme's experience mirrors that of the general population then he would expect a reduction in liabilities of the order of 0.5%. To the extent that the Scheme's experience does not show the same degree of slowdown in improvements the impact would be less.

ANNEX 10: AON ADVICE TO THE JEP



Verulam Point
Station Way
St. Albans
AL1 5HE
t +44 (0) 1727 888 200
f +44 (0) 1727 888 333
aon.com

12 September 2018

Joanne Segars (by e-mail)

Dear Joanne

Joint analysis from First Actuarial / Aon from the Joint Expert Panel (JEP)

I am pleased to set out a summary of the information we have previously given to you on the estimated impact of changes in the areas we discussed.

Estimated figures

Area	Approximate impact on technical provisions	Approximate impact on cost of future benefits, under current structure (% of pay)
A(i). Revert to September technical provisions i.e. no "de-risking" for years 0-10	c.£2.6Bn reduction (or c.£2.4Bn reduction relative to original September consultation, prior to mortality addendum)	c.1.3% reduction for current benefits (or c.0.9% reduction relative to original September consultation)
A(ii). Increase "target reliance" to £13Bn	c.£1.1Bn reduction	c.1.0% reduction for current benefits
A(iii). No "de-risking" for years 0-10, and increase "target reliance" to £13Bn	c.£3.5Bn reduction	c.1.9% reduction for current benefits
B. Use the CMI 2017 mortality table (published March 2018)	c.£0.2Bn-£0.3Bn	c.0.1%-0.15%
C. Rebase technical provisions on updated market conditions (at 31/3/18 say) by implementing new valuation	At the 7 June EPF meeting, the USS Executive indicated a reduction of "about £2Bn to £3Bn" to the technical provisions deficit at 31/3/18	USS Executive indicated that there was likely to be no material impact (but it will be important to understand what it is)
D. Reduce deficit payments from 6% of pay to 2.1% of pay	Nil	3.9%
E. Allow for declining future service rate (over 6 years)	Nil	c.1.5%

Notes:

- The figures for A(i) were derived from the Scheme Actuary's valuation paper dated 8 December 2017. The figures for A(ii) were provided by the trustee in the 1 September technical provisions consultation. We have estimated the figures for A(iii) based on the information for A(i) and A(ii), and these figures are more approximate.
- The figures for B have been calculated approximately by Aon, based on cashflow information provided by the USS Executive. We have assumed that the trends in national mortality are applicable to the USS, which we regard as appropriate. It is possible that the trustee will wish to study its own mortality trends over 2017/8 in more detail, though the 2017 mortality review was we understand the first detailed study for 6 years and so we would not expect the trustee will need to carry out a further study in 2018.
- The figures for C were provided verbally by the USS Executive, and were not validated in writing. However, we understand that additional information may now have been provided by the USS to the JEP.
- The "calculation" here (6-2.1=3.9) is trivial, and applies to the deficit contribution element of the joint employer/employee contribution rate (rather than the cost of future benefits). We set out further comments on the recovery plan in Appendix 1.
- The figures for E were calculated approximately by Aon. We have set out further comments in Appendix 2.



Potential further changes to demographic assumptions

We were asked to comment on three areas that the JEP has raised directly with the trustee:

- **% of females leaving behind a dependant.** Here, the valuation results are not particularly sensitive because the partners of females are assumed to be 3 years older than their partner on death (so e.g. with an average 65 year old at the valuation date living to around 89, their partner would be assumed to be 92 at this point and would not be expected to live much longer). We understand (from the 1 September 2017 technical provisions consultation document) that a 5% reduction in the assumption would make less than <£0.1Bn difference to the liabilities.
- **Ill-health mortality.** Here, our understanding was that while a single assumption applies to normal vs ill health members, the full mortality modelling does distinguish between these effects. (This was set out in Mercer's longevity review shared with Aon on 15 November 2017.)
- **Age of retirement assumption.** Here, while the approach was updated to give credit for members retiring later on average, we understand that there is a question around female retirees. We understand (from the 1 September 2017 technical provisions consultation document) that the impact of increasing the retirement age for active members by one whole year (for males and females) would be to reduce the deficit by about £0.4Bn. This demographic assumption is more material (out of the "smaller assumption"), though we would expect the trustee to apply some judgement when taking credit for members not retiring at the earliest age they can draw benefits unreduced from (i.e. 60 we understand for pre 2011 benefits).

The trustee stated in its 1 September 2017 consultation that all assumptions aside from the discount rate and mortality assumption use a best estimate approach.

Caveats

The figures are all approximate and should be treated with care, as Aon has not carried out independent valuation modelling. Ultimately the Scheme Actuary would need to calculate any figures for the stakeholders to be able to rely on them. In addition, and as agreed with UUK, we provided information in some areas where movement may be feasible, but for the avoidance of doubt we do not seek to represent the views of UUK (or those of the participating institutions) in this response.

The illustrated figures show the impact on the cost of current benefits if certain changes are made to the assumptions. We are not suggesting that this is what employers/employees would pay in practice even if the trustee adopted this overall funding approach, and we understand that any refined valuation results following Stage 1 of the JEP would be used by the JNC to discuss potential benefit reform.

This letter, and the work relating to it, complies with 'Technical Actuarial Standard 100: Principles for Technical Actuarial Work' ('TAS 100') and 'Technical Actuarial Standard 300: Pensions' ('TAS 300'). It has been prepared on the legal terms set out in Appendix 3.



Yours sincerely

A handwritten signature in blue ink that reads "J. Coulthard".

John Coulthard
Aon Hewitt Limited
john.coulthard@aon.com



Appendix 1 – Further information on Recovery Plan

Recovery period from valuation date	Period over which deficit contributions above 2.1% are payable	Current benefits: £7.5bn deficit				Illustrative £4bn deficit (added by Aon)			
		Asset outperformance:				Asset outperformance:			
		0%	10%	25%	50% (added by Aon)	0%	10%	25%	50%
12 years	10 years	8.8%	7.8%	6.3%		4.7%	3.7%	2.2%	
13 years	11 years	7.9%	7.0%	5.6%		4.2%	3.3%	1.9%	
14 years	12 years	7.2%	6.3%	5.0%	2.8%	3.8%	2.9%	1.6%	Nil
15 years	13 years	6.6%	5.8%	4.6%		3.5%	2.7%	1.5%	
16 years	14 years	6.1%	5.3%	4.2%		3.3%	2.5%	1.4%	
17 years	15 years	5.7%	5.0%	3.8%	1.7%	3.0%	2.3%	1.1%	Nil
18 years	16 years	5.3%	4.6%	3.5%		2.8%	2.1%	1.0%	
19 years	17 years	5.0%	4.3%	3.3%		2.7%	2.0%	1.0%	
20 years	18 years	4.7%	4.0%	3.0%		2.5%	1.8%	0.8%	

This table uses information supplied to JNC by USS on 22 November 2017, and we have expanded it with the Aon calculations shown in red.

These figures were based on a 31 March 2017 valuation date, and assumed that 2.1% was paid until 1 April 2019. For the March 2014 valuation, a 17 year recovery plan was adopted with 50% allowance for asset outperformance.

The figures with a £4bn deficit are based on a scenario where the trustee adopts A(ii), B, and C, whereby the resulting deficit would be about £4bn rather than £7.5bn. This is for illustration purposes only.

4



Appendix 2 – Further information on Declining Future Service Rate

The theoretical cost of DB benefits reduces in the early years. This effect stems from the separate USSIM investment returns that apply for years 0-10 (lower returns, where gilt yield reversion is assumed to occur) – and for years 10 onwards (where a more “normal” investment world is assumed). So in the early years, a reduction applies because one year of lower return from year 0-10 is replaced with one year of higher return from year 10 onwards, cheapening the cost of benefits. In the later years, we estimated that the cost slightly increases (which is what one would expect given the assumed investment “de-risking”).

The trustee’s default approach in effect is that, if the assumptions are borne out in practice, then the cost of future benefits will fall at future valuations, and employers/employees will then pay lower contributions over time.

As requested, we calculated the impact of giving advance credit for the smoothing of contributions over a 6 year period (covering two valuation cycles). This would lead to the cost of future service benefits reducing by about 1.5% of pay. An alternative way to present this is to develop an annual schedule of payments, where the calculated cost is presented on an annual basis, but with recovery plan contributions adjusted to achieve contributions that are level overall. Here’s an example to show how this works:

Year	Estimated cost of new accrual for stable population (% of pay) based on November 2017 technical provisions	Deficit payment	Total for DB element
1	28.1	0.6	28.7
2	27.5	1.2	28.7
3	26.9	1.8	28.7
4	26.2	2.5	28.7
5	25.6	3.1	28.7
6	25.0	3.7	28.7

Note: under the cost of DB future accrual is 28.1% of pay (Scheme Actuary’s valuation paper dated 8 December). In constructing the “Deficit payment” column, we assume that the stakeholders want to take credit for a 1.5% cost reduction over 6 years as above, pay 2.1% deficit recovery contributions on average over 6 years, and that total contributions are held level.

Please note that for our approximate figures:

- There is a possible interaction of this change with area C from the letter (i.e. the initial reduction in cost may be different if the trustee revisits its investment modelling assumptions at 31 March 2018, particularly if it revises the amount or time period for assumed gilt yield reversion).
- We make no allowance for the expected increase in cost of benefits each year due to projected increases in life expectancy (e.g. a 40 year old at Year 2 would be expected to live slightly longer than a 40 year old at Year 1); and also make no allowance for reduction of cost that would arise due to the normal retirement age increasing in line with state pension age. We would expect the trustee to allow more accurately for these effects in any refined modelling.
- We assume that the proportion of total payroll in respect of pay above the salary threshold is constant in real terms over the period (at the valuation date, the cost of DC benefits is assessed by the trustee as being 2.1% which comprises the 12% employer contribution and 8% employee contribution, meaning that approximately 2,120=10.5% of total payroll is in respect of pay above the threshold). It is not obvious to us how this proportion would evolve over time. In particular older higher earning members (who will have benefited from promotions and/or elements of pay linked to service) will likely be replaced over time with younger lower paid members who have a higher proportion of pay below the threshold. So even if the total payroll increases in real terms this does not necessarily mean that the proportion of pay above the cap is increasing. We do not have the data to assess this further. Again, we would expect the trustee to consider this effect in any refined modelling.

5



Appendix 3 – Legal terms

This Letter is our advice to Universities UK ("UUK"), to provide information on the potential impact of amending particular assumptions for the 31 March 2017 actuarial valuation of the Universities Superannuation Scheme (the "Scheme" or "USS") to the Joint Expert Panel ("JEP").

Our client is UUK. They have requested us to prepare this Letter to the JEP. Their aim in making that request was to assist the JEP in its deliberations. However, our sole responsibility is to our client, and we accept no liability to the JEP (or anyone else) in respect of this Letter, or of anything we say to the JEP. Your acceptance of these terms is a pre-condition of receiving our Letter.

Aon is not and does not hold itself out to be an independent expert witness to the JEP. As stated above our sole obligation is to our client, UUK, which is one of the stakeholders involved in the 31 March 2017 actuarial valuation discussion and associated benefit reform discussion.

Where we have quoted figures in this note, unless otherwise stated, these have been supplied by the trustee or the Scheme Actuary, and relate to the final Technical Provisions assumptions set out in the Scheme Actuary's valuation paper dated 8 December 2017 ("31 March 2017 Actuarial Valuation - Assumptions approved for the scheme's technical provisions to value current benefits offered"). We have not checked the accuracy of the figures or undertaken independent checks, other than to undertake a review for overall reasonableness. In particular we have not carried out any independent modelling of the finances of the Scheme.

Our Letter should not be used by the JEP as a substitute for any review, enquiries, procedures or other information which ought to be undertaken by the JEP.

We do not owe or accept any duty of care or liability to the JEP or to any third party for any loss or damage arising out of or in connection with the Letter, howsoever arising, whether arising in or for breach of contract, tort (including negligence), misrepresentation, misstatement, breach of statutory duty or otherwise in respect of or arising out of the preparation and/or disclosure of the Letter.

ANNEX 11: FIRST ACTUARIAL ADVICE TO THE JEP



REQUEST FOR JOINT ANALYSIS FROM FIRST ACTUARIAL / AON FROM THE JOINT EXPERT PANEL (JEP)

INTRODUCTION

The JEP asked Aon and First Actuarial to work together to look at ways in which the actuarial valuation of USS might be adjusted. We understand this is part of Phase 1 of the work the JEP are doing before they undertake a more fundamental review of the valuation methodology in Phase 2.

Aon have prepared a letter addressed to Joanne Segars in her role as chair of the JEP and dated 22 August 2018. This letter follows up on the meeting of 18 July 2018 and responds to the email of 25 July 2018 sent by Jackie Wells which contained further questions. As Aon mention in their letter, a draft has been shared and discussed with us. The comments below are on Aon's letter.

COMMENTARY ON AON PAPER

Numerical results throughout the letter

We have reviewed Aon's results for the variations of technical provisions and contribution rate and we confirm that we materially agree them. Our calculations were typically within £0.1bn of technical provisions and within 0.1% of salaries in contributions.

Appendix 2 A(i) to A(iii)

These options effectively loosen the constraints of Test 1, an action we have consistently supported.

Covenant assessment is not a concept within the statutory funding framework and the JEP may want to consider whether it is helpful in Phase 2 of its work.

In their response to A(iii), Aon has suggested that "allowing for both A(i) and A(ii) would be too much for tPR and the trustee to accept". When JEP gives its view on this and any other matter, we think it would be helpful if JEP distinguished between whether it is giving a pragmatic view for the purpose of getting the 2017 valuation done or whether it is giving an expert opinion on how the 2017 and subsequent valuations should be done.

The phrase "de-risking" is in common use in the pensions industry and is often used by USS. In A(i) and A(iii), USS's phrase "no de-risking for years 0 to 10" actually means "no increase in allocation to bonds in years 1 to 10". We do not agree that buying more bonds is always "de-risking". For example, buying more bonds increases the risk that the contributions need to go up, a risk which is a high priority to both the employers and the active members.

Appendix 2 B

We agree that updating to use CMI2017 mortality and projection model is justified and indeed expected.

First Actuarial LLP, Trafford House, Chester Road, Manchester, M32 0RS
t: 0161 348 7400 w: www.firstactuarial.co.uk



Regulated in the UK by the Institute and Faculty of Actuaries in respect of a range of investment business activities.
First Actuarial LLP is a limited liability partnership registered in England & Wales. Number OC348086.
Registered address: First Actuarial LLP, Mayesbrook House, Lawnswood Business Park, Leeds, LS16 6QY.





Appendix 2 C

We note with concern that USS has not yet confirmed in writing its view of developments over the year following the 2017 valuation date. It is a requirement on the scheme actuary that developments since the valuation date are considered before signing off a valuation. Therefore the USS cannot postpone formalising its view of the post-2017 position until after the 2017 valuation is signed. Post valuation developments must be considered before the valuation is signed. If there is post-valuation date information which could be helpful to getting the valuation completed, then that information needs to be formally published.

Appendix 2 D

We see no need to anchor deficit contributions to their current level in percentage terms. We certainly think it is right to challenge the Trustee contention that deficit contributions should be in the range 3.5% to 6%. As indicated in the tables in Appendix 3, continuing to make an allowance for asset outperformance can be a substitute for 4% or more of deficit contributions. A higher assumption for asset outperformance has the potential to eliminate deficit contributions entirely.

Appendix 2 E

We support the idea of aiming for a level total contribution rate, in which the deficit contribution (if any) rises as the future service rate falls.

We have consistently argued that it is not reasonable to assess the cost of future service benefits by only looking at the cost in the year immediately following the valuation when costs fall significantly in the following years. The common actuarial premise of only looking at the contribution rate in the year following the valuation date relies on a reasonable expectation that this one year is representative of a longer period of time. Given the USS's structure of the discount rate, this is known not to be the case. The first year's contribution is not representative of the longer-term costs. Therefore the one year view should be rejected in favour of longer term planning, as is appropriate for the management of a pension scheme.

We therefore strongly support the averaging of future service contributions. Averaging over the length of the recovery plan would be logical, because then the target is full funding of past benefits and future accrual at the end of the recovery plan.

Appendix 2 F

We echo the comment made by Aon that we do not expect there to be material prudence in these assumptions, certainly so relative to the importance of a change in the discount rate.

Actuarial standards

This note complies with Technical Actuarial Standards (TAS) TAS 100: Principles for Technical Actuarial Work and TAS 300: Pensions.

Hilary Salt FIA
Derek Benstead FIA
22 August 2018

The Joint Expert Panel (JEP) is a panel of independent experts who have been examining the assumptions and methodology used for the 2017 Universities Superannuation Scheme (USS) valuation.

It is comprised of six actuarial and academic experts, nominated equally by Universities UK (UUK) and the University and College Union (UCU), with a jointly agreed chair, Joanne Segars OBE.

The findings in this report are expected to inform discussions for UCU and UUK to conclude the 2017 valuation.

For further information please visit:

www.ussjep.org.uk